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A Case Study on Organizational Culture and Its Role in the Creation of Organizational Change Efforts Within a Government Agency

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March 2010

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A CASE STUDY ON ORGANIZATIONAL CULTURE AND ITS ROLE IN THE CREATION OF ORGANIZATIONAL CHANGE EFFORTS WITHIN A GOVERNMENT AGENCY

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ABSTRACT

In this Joint Applied Project, we present organizational culture implications and lessons-learned to consider during organizational change efforts within government agencies. The government agency studied seeking organizational change was the U.S. Army Armament Research, Development, and Engineering Center (ARDEC) and the organizational change effort analyzed was the Technology and Product Development Process, otherwise known as Vector, currently in development at ARDEC. The considerations presented were based upon historic information from literature by leading subject matter experts in the field of organizational change. Observations are summarized and presented as basic guidelines for ARDEC and other agencies to consider during the design of organizational change efforts to ensure cultural aspects of change are adequately accounted for prior to deployment of such efforts.

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LIST OF ACRONYMS AND ABBREVIATIONS

AMCCOM	Armament, Munitions, and Chemical Command
ARDC	Army Armament Research and Development Center
ARDEC	Armament Research, Development, and Engineering Center
ARRADCOM	Army Armament Research and Development Center
CEO	Chief Executive Officer
DFSS	Design for Six Sigma
DMADV	Define, Measure, Analyze, Design, and Verify
DoD	Department of Defense
EMD	Engineering and Manufacturing Development
ESIC	Enterprise and System Integration Center
ESIP	Engineering Support in Production
HR	Human Resources
IPT	Integrated Product Teams
IT	Information Technology
METC	Munitions Engineering Technology Center
OCO	Overseas Contingency Operations
PMO	Program Management Office
QESA	Quality Engineering and System Assurance
RDECOM	Research, Development and Engineering Command
SED	Systems Engineering Directorate
T&PDP	Technology and Product Development Process
TACOM	Tank-automotive and Armament Command
Tech. Dev	Technology Development
WSEC	Weapons and Software Engineering Center

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EXECUTIVE SUMMARY

The objective of the report was to study the pioneering efforts of the development of Vector—the U.S. Army Armament Research, Development, and Engineering Center's (ARDEC) organizational change effort focused on a universal process for technology and product development to be followed by all projects within the organization. Organizational change, such as that which Vector is focused upon, is often driven by changing environments, market thrusts, shifting strategies, or, as in the case with ARDEC and Vector, the change effort is driven by a pursuit of efficiency for providing better products, faster, to its customers: the various Program Management Offices ARDEC supports and ultimately, the Warfighter. The creation of such a process is obviously a difficult one with many intricate design details required. However, based on the observations of leading experts in the area of organizational change, such as those of John P. Kotter, one of the major areas of concern for the Vector team may be dealing with the organizational acceptance of a change effort, such as that of Vector, and the associated organizational culture considerations. The major objective of the report is to serve as a case study of a real organizational change effort within a government organization, offering guidelines to ensure the adequate consideration of organizational culture in change efforts.

The U.S. Army's Armament Research, Development, and Engineering Center is an organization with unique products and customers. The center's products have yielded numerous success stories on the battlefield and in the form of numerous awards and accolades for ARDEC's workforce. However, to better respond to the ever-changing scenarios related to the nation's defense and to ensure that high quality products reach the Warfighter faster, ARDEC's leadership decided to address the inefficiencies within the organization head-on with the creation of a new Technology and Product Development Process. This process has been carefully designed with the organization's members and its variety of projects in mind, while borrowing from similar industry endeavors and lessons learned related to technology and product development. The new ARDEC process would offer all organization members and projects with a guideline for successful

and efficient project completion and was therefore named—Vector. Vector's main objectives would focus on the reduction of life cycle costs, shorter developmental cycles, introduction of measures that reduce inefficiencies, and the maximization of synergistic effects within the organization.

The development and design of Vector's details and intricacies was not an easy task and it is still underway at ARDEC by the Vector Team. Vector is a Lean Six Sigma Project and has been successful in utilizing the fundamental structure of Design for Six Sigma during the design of this new process. The Vector project itself was broken down into five project phases (Define, Measure, Analyze, Design, and Verify) with phase gate reviews required between each of these phases before the project would be recommended to proceed to the next phase. The gate reviews were chaired by members in ARDEC headquarters and by Vector project stakeholders. This has ensured that the progress of the Vector team was adequate and was meeting all of the requirements. Presently, the Vector team is in the Analyze phase and has made great progress by considering all stakeholders' concerns and successfully translating them into requirements. The team has just finished formally presenting the first "draft" of the Vector process to its stakeholders for their comments and feedback in order to provide additional tuning in the next phase of the project. The remaining phases will have the Vector team flesh out all of the details within the process and verify that all stakeholders, internal and external alike, have their concerns addressed prior to Vector rollout.

The extraordinary amount of work required would not have been accomplished without the diverse membership within the Vector Team. The team consisted of representatives from all of the major areas, or competencies, within the ARDEC organization. Additionally, contractor support from experts in the field of technology and product development and Six Sigma, with relevant experience in major corporations, guided the team throughout. The use of industry benchmarking and active stakeholder participation and feedback were areas of strength during the development of Vector that was complemented by the team's open-door policy allowing any ARDEC member to become involved with Vector.

Specific guidelines based upon the authors' involvement with the Vector team are provided at the end of the report. It was the intent of this paper to study ARDEC and Vector for the purpose of offering the Vector team (or other similar change effort teams within government agencies) guidelines for application to the Vector project (or other organizational change efforts), as needed, to ensure the adequate consideration of the cultural implications of change.

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The authors would like to acknowledge the U.S. Army Armament Research, Development and Engineering Center, specifically the Vector development team, for their cooperation and for making the authors' participation in the team during the design of Vector possible. The insights attained by this immersion within the team helped the authors gain valuable knowledge of the intricacies and challenges the team faced that greatly contributed to the paper.

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I. INTRODUCTION

Organizational change in private industry is a difficult endeavor with increasing complexity as the size of the organization pursuing the change increases. A major factor that often determines the success of organizational change and related efforts is the adequate consideration of the cultural aspects of the change. Organizational change is often driven by changing environments, market thrusts, shifting strategies, or, as in the case of the U.S. Army Armament Research Development and Engineering Center (ARDEC), the change effort is driven by a pursuit of efficiency for providing better products faster to its customers—the various Program Management Offices (PMOs) it supports and ultimately the end user—the Warfighter. The need for adaptation to rapidly changing external factors is the premise for seeking organizational change and, therefore, the guidelines for leading change efforts should be equally applicable in major organizational change efforts within both the private sector and government agencies to ensure successful deployment of such efforts. ARDEC is currently in the midst of establishing a procedure for product and process development that improves upon what the organization already accomplishes—armament technology development. However, implementing this change may pose significant challenges to the existing culture engrained within the organization. For this reason, the organizational change effort, known as the Technology and Product Development Process (T&PDP), or also known as Vector, is being utilized in this report as the exemplary organizational change effort, and ARDEC as the model government agency seeking organizational change.

The objective of this report is to study the pioneering efforts of the development of Vector—an organization-wide technology and product development process within ARDEC. The report will briefly discuss the design layout required for the development of such a process but will primarily focus on the cultural implications related to the deployment of the organizational change effort that VECTOR stands to be. As a result of this project, guidelines for cultural considerations will be presented based on historical observations from experts in the field of cultural change. Additionally, details required for the creation of a modernized technology development process will be identified along

with the challenges faced and lessons learned by the process developers. The report stands as a case study offering the Vector team (or other similar change effort teams within government agencies) guidelines for application of the Vector project (or other organizational change efforts), as needed, to ensure the adequate consideration of the cultural implications of change.

The main source of research for the paper was predominantly in the form of active participation within the VECTOR team during actual design phases of VECTOR as well as participation in the stakeholder feedback sessions conducted by the VECTOR team. These activities offered hands-on experience to expedite the understanding of what the VECTOR team was embarking upon as well as offering a plentiful source of information on the details of the Vector project itself, the need for it, the challenges faced, and how the final product was envisioned by its designers. Furthermore, considering that the Vector team consisted of members from a multitude of major organizational subdivisions across ARDEC, and drawing from one of the author's experiences as an ARDEC organization member of seven years, much of the information on the current culture of ARDEC, as well as the concerns from an organizational culture standpoint, were able to be drawn from for the report. Much of the research literature used for the paper was from leading subject matter experts on organizational change and impacts on organizational culture, predominantly from the writings of John P. Kotter, a world renowned expert on business leadership, among other authors.

The paper is organized in a manner that allows for the basic understanding of the organization involved, ARDEC, and the premise for its pursuit of a Technology and Product Development Process (Vector). This background information is presented to the reader first, along with a discussion of what Vector is and how the Vector team planned on designing this process. Having a clear and basic understanding of the necessary background for the reader, a discussion on the implications of cultural change that may result from the ARDEC implementation of Vector is presented in depth. The analysis portion of the paper is presented in the manner of observations of the Vector project and the Vector team and considers how these observations relate to historical challenges observed with organizational change and organizational culture. The historical

observations presented are summarized into basic steps that leading subject-matter experts recommend for application in organizational change efforts, such as Vector, and are presented as guidelines for application to Vector, to be followed as necessary. As a part of the analysis portion of the paper, guidelines are translated into recommendations, however, specifics such as the exact details of what should be incorporated into the Vector design are considered beyond the scope of the paper. This is due to the complexity of the subject matter and the desire to maintain the flexibility to tailor these findings to other organizations.

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II. THE ARDEC ORGANIZATION AND THE NEED FOR VECTOR

A. ARDEC BRIEF HISTORY AND BACKGROUND

The Armament Research, Development, and Engineering Center (ARDEC) is an award-winning research and development lab for armament technology within the U.S. Army. Headquartered at Picatinny Arsenal, NJ, ARDEC is the Army's principal researcher, developer and sustainer of current and future armament and munitions systems. ARDEC's overall mission is to provide “Innovative Armaments Solutions for Today and Tomorrow” by improving already fielded items, developing new products/systems, maintaining a strong armament technology base in government, industry and academia, and providing technical support to the soldier in the field. In this way, ARDEC serves as the U.S. Army’s center for technical subject-matter expertise in armaments, munitions, and technology—specifically for technical development, engineering, and engineering support in manufacturing and production.

The origins of this Army technology center began in 1977, when the government created the U.S. Army Armament Research and Development Center (ARRADCOM) with the mission of creating new weapons and munitions, as well as improving legacy programs. The headquarters of this new command was on the site of the former Picatinny Arsenal in north central New Jersey. In 1983, the Army disestablished ARRADCOM and placed its mission at Rock Island Arsenal in Illinois under its Armament, Munitions and Chemical Command (AMCCOM), maintaining the bulk of weapons and munitions research and development at the Picatinny site, then called the U.S. Army Armament Research and Development Center (ARDC). In 1986, after the Army ordered all R&D centers to recognize an important aspect of their work with a name change, ARDC became what it is known as today, ARDEC, the U.S. Army Armament Research, Development and Engineering Center. The name remained the same despite the center's transfer from AMCCOM to the Tank-automotive and Armament Command (TACOM) in

1994 and to the Research, Development and Engineering Command (RDECOM) in 2003. More importantly, the mission remained the same, to develop high quality weapons and munitions for U.S. Warfighters.

The ARDEC-developed items and the efforts of the workforce were ultimately put to the test during Operation Desert Storm in 1991, including products such as the warhead for the Patriot missile, the fire control systems and the ammunition for both the Bradley Fighting Vehicle and the Abrams Main Battle Tank, and the laser guided Copperhead artillery projectile. These items performed exceptionally and were still in use a few years later during the conflicts in Afghanistan and Iraq. Also playing a key role during the war in Afghanistan was ARDEC's bunker defeat munition. Singled out for praise during the Global War on Terror were the M107 sniper rifle, the 120mm M830 high explosive, multipurpose tank round, the M211 and M212 countermeasure flares, the M4 carbine, and several types of small arms ammunition and electric detonators.

Today, ARDEC employs over 2,500 highly skilled scientists, engineers and other technical specialists situated at five different locations throughout the United States. ARDEC is currently responsible for several hundred programs that are in one of the following phases of the Acquisition Process: Basic Research, Applied Research, Concept Demonstration, Development, Production and Deployment. The Center's efforts are concentrated in five major technical areas: Advanced Weapon Systems, Fire Control, Logistics, Advanced Energetics and Warheads, and Emerging Technologies. These areas include much of the subject matter expertise that ARDEC is uniquely known for in the defense industry as shown in Figure 1.

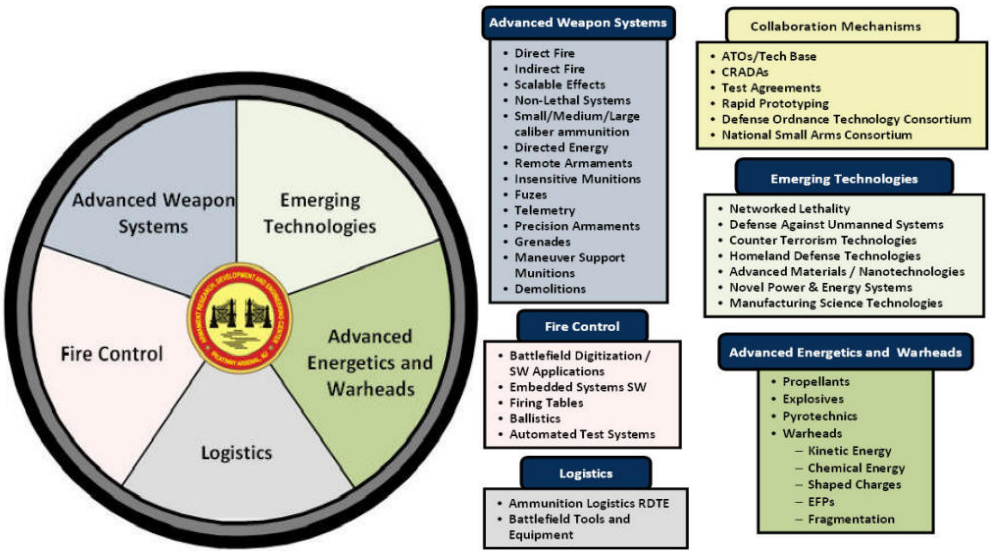

Figure 1. Armament Research, Development and Engineering Center's (ARDEC) major technical concentration areas. (From ARDEC)

To support these efforts, ARDEC's technical workforce is divided into multiple directorates with varying competencies and engineering expertise in the areas of armaments and munitions, as shown in Figure 2, which enable ARDEC's mission. ARDEC's end customers are various Program Management Offices (PMOs), including PEO Soldier, PEO Ammunition, and ultimately the end user—the Warfighter.

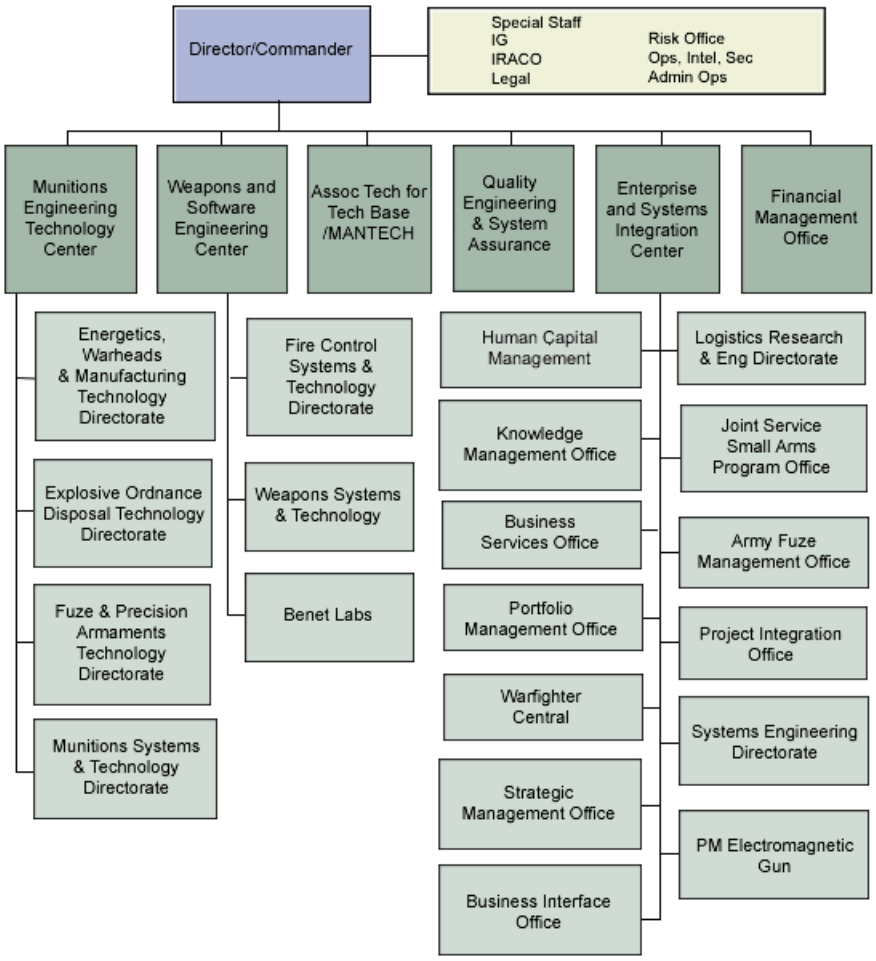

Figure 2. Current ARDEC directorates and competency structure (From ARDEC)

ARDEC has been the recipient of many prestigious national awards including the 2007 Malcolm Baldrige National Quality Award, the Presidential Award for Quality, two Army Communities of Excellence Awards and several Army Research and Development Organization of the Year Awards, distinguishing ARDEC as an organization committed to providing its ultimate customer, the Warfighter, with the most effective products found anywhere in the world. ARDEC continues to strive to be the Army's "Center of Lethality" and, as such, is leading the way in the development of tomorrow's armament and munitions systems, working closely with its Army, Navy, Air Force and Marine partners.

B. THE NEED FOR A TECHNOLOGY AND PRODUCT DEVELOPMENT PROCESS

ARDEC's quest for excellence and commitment to quality resulted in changes within the organization that have been implemented over the years and more recently with increased frequency. For many years the organizational structure at ARDEC remained relatively unchanged and with the advancement and creation of new technologies and capabilities, the ARDEC organization began accommodating these changes as much as was possible given the organization's structure. Technology advancement, new threats facing the nation, and changes within Department of Defense acquisition policy were some of the compelling reasons that prompted a reorganization that began in the past few years. Most of the reorganization efforts were aimed at posturing ARDEC for easier adaptation to change and response to the ever-changing needs of the Warfighter. Other focus areas included unifying the organization (one voice), addressing inefficiencies, overall program control, and organizational strategic direction.

ARDEC leadership decided that one of the primary means of addressing inefficiencies would be implementation of a standard, universally applicable process for technology development within ARDEC since a process such as this had never existed. The new process would be universally tailorable to all ARDEC projects, regardless of scope and complexity, and would focus on product and process development. This new process, called the Technology and Product Development Process (T&PDP), would borrow from successful industry endeavors related to product and process development in order to achieve organizational efficiencies comparable to those seen by a few captains of industry.

One can understandably question why an organization such as ARDEC would need such a process. The critics would immediately dismiss standardization of processes as an inhibitor to creativity and ingenuity in a field where previous breakthroughs depended on experimentation and innovation. However, processes have always existed unofficially within ARDEC, but have either been rarely documented or were inadequate or not applicable to all of the products that an organization as diverse and unique as

ARDEC has to offer. Over the years, what worked for one successful project was applied to other upcoming projects and this became the unofficial process followed by the organization. The application of this unofficial process was often inadequate as programs tended to be unique with varying scopes, resources, and program issues. This became more apparent to ARDEC headquarters as their efforts to achieve organizational efficiencies throughout ARDEC were pursued more eagerly than ever before. The answer to why ARDEC would need such a process becomes evident with the posing of the question, "How can efficiencies be improved upon if processes are not documented or standardized?" This question begins to clarify the importance of the need for a process which can be summed as follows—a process is needed in order for the organization to know what to do and when to do it through the use of standardized tools, best practices, and project management methods and for the assessment of current and future projects. Before the T&PDP is defined in more detail, the need for and the benefits related to the use of such a process must be further expounded.

Let us look specifically at the benefits of utilizing such a process. One of the important benefits would be in an area that all government agencies, especially within the Department of Defense, must pay very close attention to—the *reduction of life cycle costs*. The ARDEC organization is unique—with subject matter experts that, in some cases, cannot be found anywhere else in the world. This uniqueness makes standardization of processes very difficult, but unfortunately, without procedures in place, it is nearly impossible to analyze existing processes for inefficiencies or for areas of improvement. The creation of a technology and product development process would allow for project tasks to be done at the proper time during development, quite possibly avoiding or mitigating life cycle cost risks before encountering them. A process for technology and product development would assume an organizationally proactive stance throughout the life cycle, especially in the area of overall project cost avoidance as opposed to cost savings only in the short term.

ARDEC's quest for the reduction of both overall schedule and cost points directly towards efficiency in processes, especially in *shortening the developmental cycle*. Though not all ARDEC members know the details of a particular technology area, a

variety of skills and lessons learned are available among the organization in general. A process for developing technology or products would provide the ability for all members to harness this valuable information for application to all ARDEC products. This would be accomplished with the use of the T&PDP's structured yet flexible "phase gates" and "reviews" each of which would have review panels headed by experienced staff. These would consist of defined activities and exit criteria to ensure that projects are ready to proceed to the next life cycle phase. Phase gate reviews would provide the necessary forward looking and preventive posture for the organization that would identify inefficiencies early in the life of a program that may otherwise have been identified at a much later stage with greater unavoidable negative consequences. The reviews and phase assessments would offer analytical tools for a project at all of the phases enabling accurate, rapid, and measurable 'go'/'no go' decisions. The end result would be improved probability of success for projects, products and technologies developed throughout the organization.

A technology and product development process would also reduce or eliminate inefficiencies for all of ARDEC's processes regardless of scope and of technology maturity. Often times, during ARDEC's quest for providing products to the Warfighter rapidly, robust technologies end up becoming tied up in bureaucratic tape that result from internal policies in place that simply are not applicable to all programs and program stages. The T&PDP would be tailorable enough that robust technologies would be identified and rapidly transitioned to Program Managers and Warfighters. Through the use of built-in tools and controls of T&PDP, critical parameter management and performance, quality, reliability and lifecycle impacts would be assessed rapidly before the transition of the technologies and products to the customer. The end result would be rapid and satisfactory fulfillment of customer requirements.

Once completed and fully implemented, the T&PDP process would essentially map the ARDEC "way of doing things" that over the years have been previously applied and proven successful. Fine tuned and streamlined by way of thorough phase gate reviews and the application of technical knowhow harnessed from the entire organization, the process would yield an extremely valuable 'How To' map for new and experienced

organization members alike to follow. Shorter learning curves, common language, and aligned integration of existing PM, Systems Engineering and Lean Six Sigma tools would be end results expected to be achieved by the new T&PDP. The usefulness of applying a standardized and tailorable process would enable the entire organization to be on the same page while providing ARDEC headquarters with the ability to measure successes or analyze failures. Having the entire organization utilize the same proven process, coupled with the ability to take lessons learned and apply them to future products, will improve the probability of success for future endeavors regardless of scope, technology and maturity. These actions will place ARDEC in a controlled, proactive and flexible posture ready for the uncertainty of the future that is often common in the defense industry.

C. WHAT IS VECTOR?

The T&PDP, currently in development by ARDEC, would aim to benefit the entire organization and the supported PMOs—by streamlining processes for successful project development; and the Warfighter—by providing troops with state-of-the-art technology products faster than ever before. More specifically, the T&PDP would accomplish this through the reduction of life cycle costs, shortened development cycle times, transition of more robust technologies and products to the end-user while better posturing the organization for future changes. The process itself would essentially serve as a fully developed and proven waypoint, providing guidance and direction to all ARDEC members for arriving at project success. Similar to the definition of a vector, the ARDEC T&PDP would serve as a course or compass direction for navigating the various ARDEC Integrated Product Teams (IPTs) through the diverse technology and product development projects to ensure that the right actions are taken at the right times. For this reason, the T&PDP project is known to ARDEC as Vector.

Vector project members are actively involved in creating this new and potentially revolutionary process that would change the way ARDEC has done business over the past few decades. This significant feat will have its obstacles and will rely on a diverse team whose application of knowledge and experience may very well dictate Vector's failure or success. Vector team members are subject matter experts that come from a

variety of relevant backgrounds, both within ARDEC as well as from industry, specifically in areas of Systems Engineering, Project Management, Organizational Strategy, and Design for Six Sigma. In fact, Vector is a Lean Six Sigma Black Belt project led by the Enterprise and System Integration Center (ESIC) at ARDEC, responsible for organizational strategic efforts, and it is sponsored by the ARDEC technical director. Vector team members directly involved with the design and rollout of the project include subject matter experts from the numerous ARDEC directorates, with broad representation from the variety of projects currently at the organization. These ARDEC directorates include ESIC, Munitions Engineering Technology Center (METC), Weapons and Software Engineering Center (WSEC), and Quality Engineering and System Assurance (QESA).

D. VECTOR'S PHASES AND WHERE THE PROJECT IS TODAY

Vector is a Lean Six Sigma project that contains the fundamental structures of a Six Sigma method for creating new product and new process designs, referred to as Design for Six Sigma (DFSS), which is aimed at not only preventing problems but also at doing the right things at the right time during product or process development. DFSS tailored to fit a research and development environment is known as DMADV: Define, Measure, Analyze, Design, and Verify which represent the phases that a DFSS project would pass through in order to successfully complete a project. Generally, the DMADV can be described and applied as follows: *Define* design goals consistent with both customer requirements and organizational strategic interests; *Measure* and identify critical characteristics, product capabilities, and also risks; *Analyze* to develop alternative designs, create a high-level design and evaluate design capabilities to select the optimal design; *Design* the optimized approach with details considered while planning for verification of design often times requiring simulations; and *Verify* designs by setting up pilot runs, implementation of processes, and officially rolling out to the process owners. The Vector project will follow along the DMADV phases, passing through the necessary gate reviews between each phase, and ultimately rolling out and implementing Vector throughout ARDEC for official use (as shown in Figure 3).

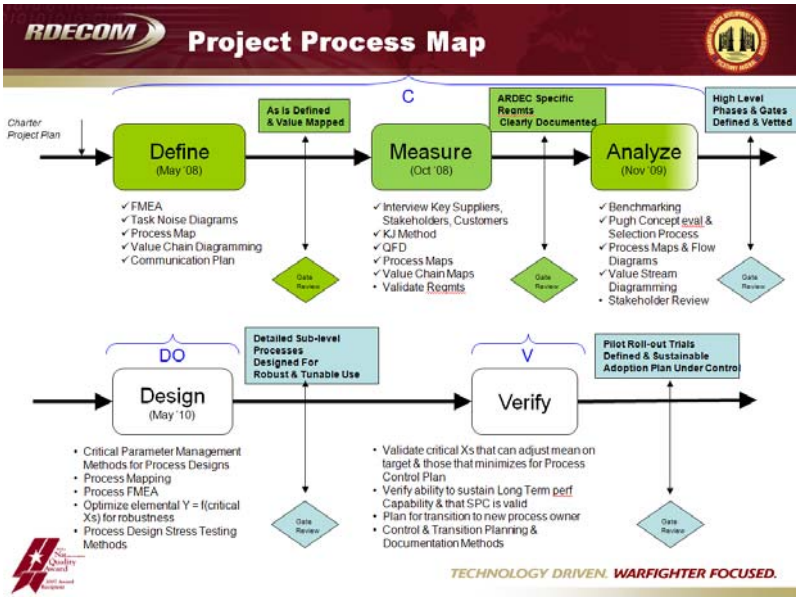

Figure 3. Vector Project Process Map indicating project phases, major tasks and present status. (From ARDEC)

Vector began in 2007 after considerable efforts aimed at obtaining efficiencies throughout ARDEC pointed towards the need to identify current processes for further analysis and to determine potential areas of improvement. Since technology and product development is ARDEC's primary mission, a lack of defined processes to accomplish this function was a major concern to ARDEC leadership and this prompted the creation of the Vector project. Since its beginnings, Vector was an effort knowingly comprised of daunting tasks, but also an effort acknowledged by all involved to be of significant importance to ARDEC and worthy of pursuit for all stakeholders involved.

1. The Define Phase

The first DFSS phase, "Define," began in late 2007 and focused on the definition of the Vector project goals themselves and was aimed at ensuring the goals and requirements of the project were aligned with stakeholder interests. This initial phase resulted in the creation of the Vector project Charter, overall project planning, and the creation of communication plans, which would be living documents to be updated in subsequent phases of Vector. One of the most significant and difficult tasks within the Define phase was the creation of the "As-Is" Vector Process Maps. For this critical part

of the phase, Vector attempted to map out (with as much detail as possible) where the ARDEC organization was in terms of how business was realistically accomplished. This meant identifying and fully understanding projects of all kinds and scales that exist and how all of these projects get accomplished, throughout the organization, regardless of the phases of the DoD Lifecycle Framework. This was a difficult task considering that ARDEC at any point in time is directly involved with hundreds of projects in various phases of the DoD lifecycle framework, from small caliber ammunition, to complex artillery munitions and the associated delivery systems, including advanced technology under development. This mapping would include the cultural and commodity/domain experiences that are embedded in how ARDEC accomplishes work.

The approach taken to accurately account for all of ARDEC's projects was to split up the products at ARDEC and to classify these products into different categories, in accordance with the various phases of the Defense Acquisition Management System shown in Figure 4.

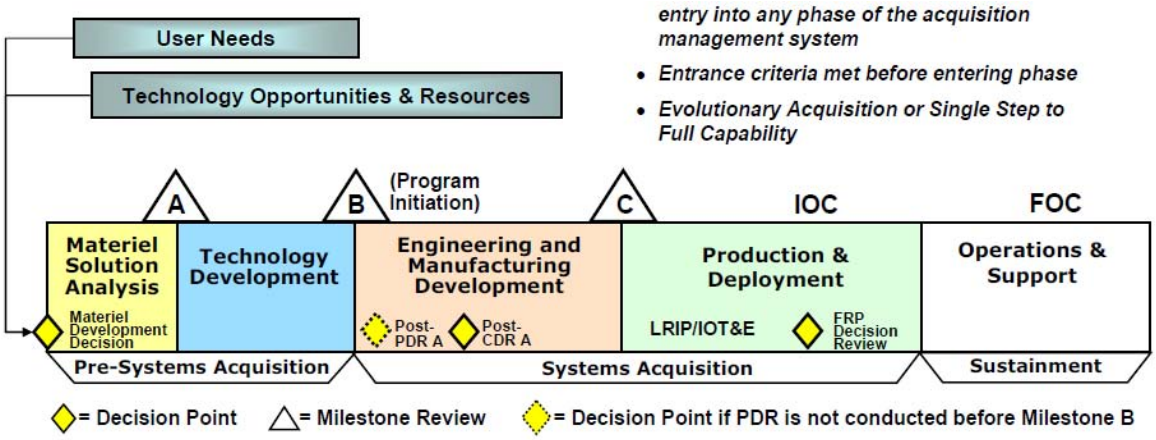

Figure 4. Defense Acquisition Management System from DoDI 5000.02 (From DoDI 5000.02)

The relevant categories included Technology Development projects (Tech. Dev. or Tech. Base), Engineering and Manufacturing Development projects (EMD), Engineering Support in Production projects (ESIP) that take place post-Milestone C, and finally, urgent-need projects termed Overseas Contingency Operations (OCO) that are on

an as needed and urgent basis and tend to follow unique lifecycles. All projects at ARDEC were determined to fall into one of these four categories; therefore, one "As-Is" process map for each of these categories was created. Figure 5 depicts a snapshot that provides a general depiction of a draft As-Is map that was created for Tech Base Projects at ARDEC, shown here to demonstrate the details each of the As-Is maps contained.

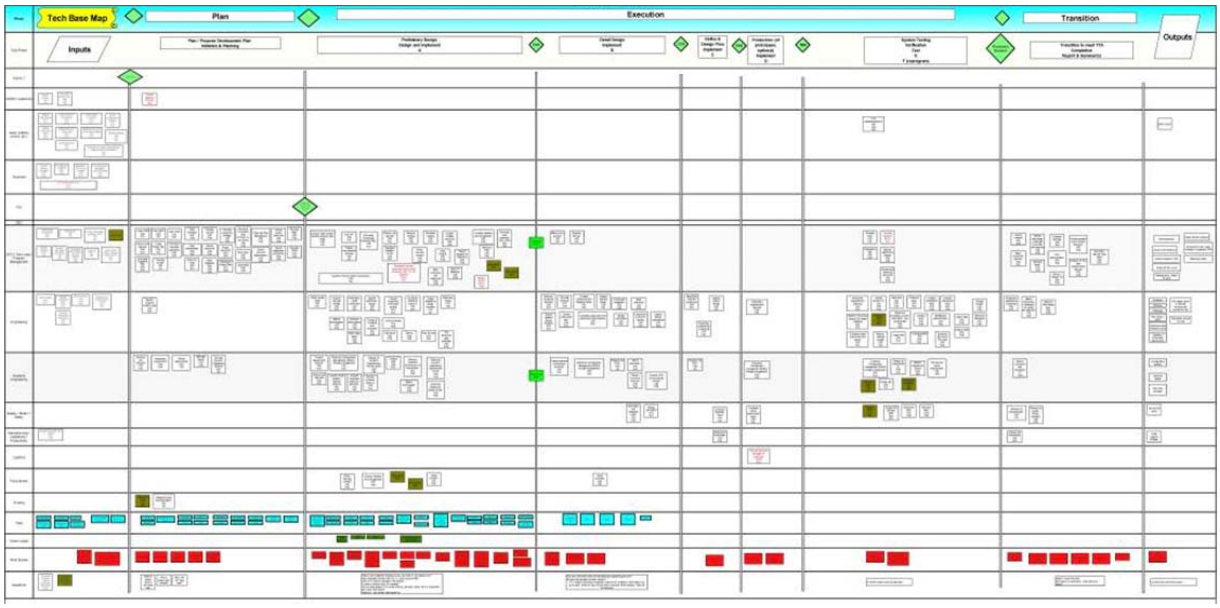

Figure 5. Depiction of the level of detail for a process map created by the Vector team indicating the "As-Is" or current processes followed by ARDEC for projects in the Technology Development phase of the Acquisition Lifecycle Framework. (From ARDEC)

Also of importance in the Define phase was the initial generation of the Vector project requirements which would serve as the critical first step to ensure all stakeholders' needs would be identified and synthesized in the upcoming phases. During the initial attempts at process mapping and needs identification, several common themes were generated, and these often included both good and bad aspects in regard to how ARDEC conducted projects. Figure 6 shows common themes and initial results from the Define phase presented at that Phase Gate Review. The 'Define' phase successfully passed through the Phase Gate Review in May of 2008.

Good	Bad
Surplus of SW Based Tools	Large Variability in Execution of Projects
M&S Tools	Loose interpretation of DOD5000
Facilities	No consistency across phases
People prefer "in house" test capability	PM Guidance/Expectations
Fire Fighting –"we always rise to the occasion"	Duplicative reporting
Committed to the Cause – Commitment to our Warfighters	Inconsistent deliverables
	Process needs to be adaptable to project size and duration.
	Processes are to be worked around
	Technology & design development are build, test, fix cycles
	Fuzzy Front End – lack of definition or funding
	Funding Delays
	Procurement
	SAP

Figure 6. Initial results from current ARDEC processes depicting positive and negative aspect of how business was conducted at ARDEC prior to Vector. (From ARDEC)

2. The Measure Phase

The Measure phase of Vector was aimed at the identification and refinement of the critical aspects of the project. Key to understanding current processes was the ability to receive the necessary feedback from the organization's stakeholders, including members from within the ARDEC organization, as well as key customers, such as the various Program Management Offices for verification of Vector's requirements. This was achieved by way of a number of stakeholder feedback sessions that aimed at understanding not only ARDEC's way of doing things but also the concerns in regards to the present processes in place. From this numerous data (as depicted in Figure 7), the critical needs of the stakeholders were structured, ranked, re-validated by the stakeholders, and finally translated from critical need statements to Vector requirements. Though Vector was at its initial stages during this phase, resistance from stakeholders to this new process was already apparent, according to Vector team members and their observations at stakeholder sessions. This resistance was made evident by the observed lack of focus-group session participation resulting in smaller feedback session groups than expected, which prompted Vector members to question if all of the ARDEC

organization was being fully captured by the session representation. Stakeholder resistance and negative opinions of the Vector project itself were the first signs of the engrained cultural barriers at ARDEC, which might play a potentially critical role in resistance to change. Stakeholder buy-in and acceptance caught the attention of many Vector team members, and was recognized as a problem that would need to be dealt with in order for successful rollout of Vector. Though the communication plan created in the prior phase was executed during this phase, the effectiveness of the communication to the greater ARDEC was yet to be seen at this moment.

Figure 7. Depiction of the results from the stakeholder sessions in the process of being translated from critical needs to Vector project requirements (From ARDEC)

The Vector team members looked not only within the ARDEC organization, but also took part in benchmarking—meeting with industry leaders who have demonstrated success or offered lessons learned from negative experiences in recent implementation of Vector-like projects. Team members met with several companies including Kodak, Ford, Boeing, 3M, Motorola, Carrier, and Cummins. Some of these organizations had produced tremendous results in product and process development by implementation of Vector-like projects of their own while others offered experiential information on where the processes went astray for their organization. These organizations' processes were

carefully studied and it was decided that certain aspects of the other programs would be interwoven in the finalized Vector product. Therefore, parts and pieces that seemed a good fit for application to ARDEC's way of doing things would be merged, or hybridized, into the draft Vector process. In the next phase, 'Analyze', feedback from the stakeholder sessions, the benchmarking meetings, and the pieces from Industry's Vector-like projects would come together into several concepts of Vector, called Hybrid Processes for consideration down the road as potential Vector processes.

Having ARDEC project representation detailed on numerous process maps as well as the maps, processes, and current ARDEC "way-of-doing-things" detailed into measurable requirements, the Vector team was able to successfully pass through the Gate review in July of 2009, granting the team permission to enter the next phase, the Analyze phase.

3. The Analyze Phase

At the time of this writing, the Vector project is at the Analyze phase in which essential data, and lots of it, collected from the previous phases is carefully analyzed for the selection of the most ideal "Hybrid Process Architecture" that would provide a best fit for the ARDEC organization and that would ultimately serve as the official Vector product. Information feeding into this phase included the stakeholder validated Vector requirements, the ARDEC current or "As-Is" process maps for a variety of ARDEC projects, and industry benchmark information—all of which would be considered as the Hybrid process is created in this phase.

Once fine-tuned and selected by Vector team members, the best Hybrid process would be presented to the ARDEC stakeholders for validation, ensuring that all of their needs are considered and accounted for in the selected process. After the Vector process is validated by all stakeholders involved, the Gatekeeper panel would be presented with the best hybrid process and if approved, would not only grant Vector permission to proceed to the next phase but would also present the Vector team, for the first time, with an official, though developmental, Vector product.

4. The Design Phase

The Design phase of the Vector project would essentially serve as the phase that would fill in the blanks that the previous phases may have left open, though for a reason. Entering into the Design Phase, the selected Vector architecture would have the higher tiers identified, i.e., the overall processes, but the details, specifically the lean, baseline sub-process elements would truly be elaborated in this phase. Furthermore, elemental sub-processes for lean principles and robustness would be optimized, and the integration of sub-process elements & balanced process interface sensitivities under stressful enterprise & business environmental conditions would take place. In other words, the final touches of Vector would take place in this phase including testing out and resolving any "kinks" before rolling out Vector to the ARDEC organization.

The level of detail required in this phase would call for the Vector team members to solicit the support of the bulk of the team (recalling each member represents the various sub-organizations within ARDEC) as well as other key organization members for the purpose of defining DFSS Greenbelt and Blackbelt projects within and across Vector sub-processes. The results of these projects would provide valuable organizational input for leaning the process at ARDEC and for the Vector project itself.

Just as the Vector project must go through gate review panels, so too would projects following Vector processes be required to follow this course of action as they progress through Vector's various phases. For this reason, during this phase of Vector development, the details of the Vector Gate reviews would be designed including metrics such as scorecards and Gate panel selection criteria and other intricacies required for a fully functional Vector process.

5. The Verify Phase

The final phase of Vector would be the Verify phase. This phase would include pilot runs of Vector and of course the official rollout of the product to ARDEC as a whole. Aside from final checks and fine-tuning, most of the efforts would be focused on reaching operational status by undergoing successful operational assessments prior to delivering the final product to ARDEC. The rollout itself would essentially serve as the

culminating point of all of the efforts of the creation of the Vector product itself. If efforts for minimizing cultural resistance to changes brought about by Vector were not successful, the rollout of Vector may be the point in which this becomes most apparent, as we will discuss in the chapters ahead.

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III. ORGANIZATIONAL IMPACTS OF VECTOR

A. THE CHANGES THAT VECTOR WILL BRING TO ARDEC

ARDEC is known as a center of expertise for a commodity within defense that not many can claim "know-how" with—armament products and engineering development and support, from the government's perspective (a perspective that continues to evolve and diverge from that of the private/industrial perspective). The award winning organization prides itself on possessing knowledge of and dealing with the intricacies of armament technology research and development, as well as a professional level understanding of the related processes and program management within the government. The knowledge, application, and navigation through the maze of Department of Defense (DoD) acquisition and research development events, often enforced by a myriad of regulations, can most clearly be understood against a backdrop of many years of experience. After many years of developing armament systems, especially products recently fielded, a fully detailed recipe for success and continually improved processes are being sought by ARDEC leadership through the creation of Vector. Vector would not only document how things are done for future and monitoring purposes but would also provided guidance to members on proven ways of achieving success for all programs—a difficult task given the variety of programs at the organization, but one which many would agree would be of great value to ARDEC and future systems development. This chapter focuses on the perception of Vector within the ARDEC organization, and its implications to cultural change that are important to understand in order to maximize the success of an organizational change effort such as Vector.

In order to understand the changes that would occur as a result of implementation of ARDEC's Vector, one must identify the stakeholders involved and understand the perspective of change from each of their vantage points. The stakeholders of Vector are both internal and external to the organization. Internally, ARDEC personnel such as project engineers (from entry to senior level), having backgrounds in all fields of engineering, make up the majority of stakeholders. They serve as experts in fields related to armament design, systems engineering, quality engineering, and program management,

among many others. These internal organization members including branch and division chiefs (up and down the chain of command and across all ARDEC organizations), and ARDEC executives would have a stake in the outcomes felt throughout the organization upon rollout of Vector. Externally, stakeholders would include ARDEC's direct and indirect customers such as Program Management Offices (PMO) predominantly from the Army but also from other services that, in essence, hire ARDEC's services for technical support and for the organization's experience. Other external stakeholders include government agencies and organizations such as Defense Contracting Management Agency, and Defense Logistics Agency that rely on ARDEC for contractual and product assurance support and subject matter expertise for armament products in the field. Ultimately, external stakeholders would include sustainers and the end-user of ARDEC's products, the Warfighter.

External stakeholders would be in favor of the efficiencies that Vector stands to create, but the additional process steps and the introduction of numerous, ARDEC-imposed gate reviews, would seem to be an impediment that is time-consuming and too costly to overcome in order to achieve proposed efficiencies. Assuming minimal knowledge of the intricacies within Vector, many of the process steps would seem to be in addition to what DoD already requires through the Defense Acquisition regulations. To some stakeholders, especially PMOs, additional gate reviews would seem to relate to more effort by ARDEC staff to prepare for these, and eventually, would translate into additional funding required to support these reviews; with funding often the limiting resource throughout ARDEC and DoD. Vector team members may be correct in stating that cost avoidance is the long-term goal of Vector but early stages of Vector rollout would require tremendous trust from stakeholders, at least until experience (and, even, success stories) proves otherwise from their initial expectations.

Upon initial deployment of Vector, internal processes will either remain the same, become enhanced, or be replaced altogether; therefore, the greatest change seen would be to the internal stakeholders. Some existing ARDEC processes, though seemingly antiquated and inefficient, have been proven by previous success stories and years of use, all of which translates to a solid cultural obstacle to any change. Tremendous difficulty

may lie in having the organization understand the reasoning of why some processes should remain and others should be done away with. Additionally, letting go of old processes, deeply engrained throughout the culture of the organization would serve as a critical factor in implementing change within this organization. Similar to external stakeholders, it is the owners of these processes, ARDEC personnel, that would be required to take a relatively large leap of faith in trusting what Vector claims to be best for ARDEC- something many participants may agree would more than likely result in significant resistance by the stakeholders. These changes would indirectly serve as a huge blow to the "normal way of doing things" that internal stakeholders are accustomed to, and, more importantly, to the organization's inherent culture. Understanding these perspectives makes it very clear how important cultural aspects of change really are to major change efforts such as Vector.

1. Organizational Culture Defined

Culture has many meanings and often conjures up words for defining it such as "customs," "ways of thinking," and "behavior of people." However, *organizational* culture introduces complex variables into these definitions. Organizational culture can be looked at as consisting of different levels, some more clear and less conceptual than others (such as the behavior and conduct of personnel, policies and procedures) and other levels more difficult to envision (such as shared values and principles meant to guide employees to the purpose of organizational mission). The culture of an organization includes the organization's view on change itself, an important aspect of culture that is of great relevance to Vector and the Vector team. The views of change that an organization has within its culture are somewhat of a double-edged sword with both positive and negative sides (Thompson 21). The positive side of the culture of an organization is that it allows for a subtle manner in which learning and education is inherently duplicated - a learning process based purely on the human mind's ability to establish patterns of actions and thoughts for the purpose of survival. This innate duplication benefits an organization in replicating processes and ideals of the organization inadvertently generating powerful momentum. Unfortunately, in an organization, the collective minds do not acclimate to change as easily as an individual, in fact the organization holds onto those patterns quite

obstinately. The benefit of self-induced creation of norms is excellent up until a change in the organization is required, which is when the negative aspect of culture is made very clear. Norms will continue to perpetuate throughout the organization and will resistively prevent change from taking place, even when change is required for the organization's survival. Eventually, after years of operating within the "norm," the behavior of the organization is no longer suitable to the external environment, causing the organization to become inefficient and, in the worst cases, extinct. Therefore, it is imperative that an organizational culture not be underestimated and that its reaction to change be fully considered by any change agents in order to effectively steer the collective group away from this "extinction."

B. OBSERVATIONS ON THE IMPACTS OF CHANGE TO AN ORGANIZATION BASED ON HISTORY AND RESEARCH

Organizational change is not new and has been successfully implemented in organizations throughout history, however, not all have managed to transform with success; in fact, many organizations have failed to do so. John P. Kotter, a professor at the Harvard Business School, was able to analyze many years' worth of study and observation on transforming organizations and identified eight of the most common errors organizations made that led to failure of organizational transformation (summarized in Figure 8). These common errors are presented here in order to understand common pitfalls organizations have made in the past and to get a better feel for the obstacles that may lie ahead for ARDEC and the Vector team.

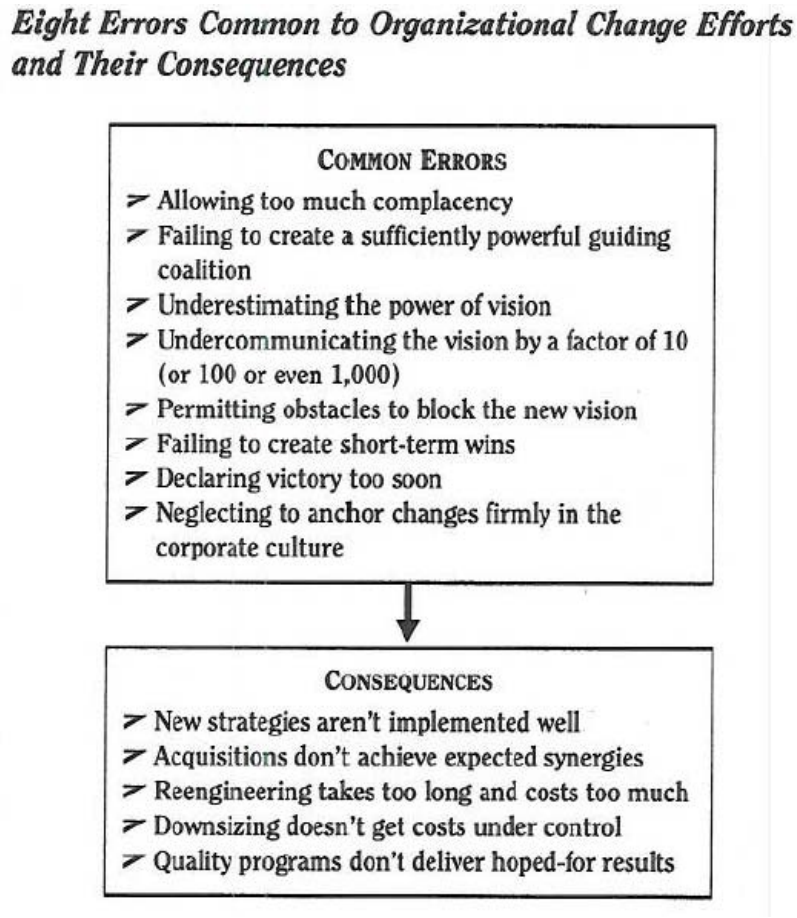

Figure 8. Eight of the most common errors observed by Kotter and their consequences (From Kotter)

Allowing Too Much Complacency is identified by Kotter as the biggest mistake that is committed during organizational change efforts. Leadership will often fail to create the required sense of urgency regarding the need for change in the organization. Without this urgency, complacency and a lack of enthusiasm for the change effort among most employees is a likely outcome. Complacent organizations lack the motivation to change, especially when previous successes and adherence to prior norms of behavior have produced acceptable results. Kotter explains that in cases where significant complacency exists, employees deal with change efforts by either becoming defensive or confusing urgency with anxiety which results in driving people "even deeper into their

foxholes and [creating] even more resistance to change" (Kotter 5). Allowing this error to take place often results in change efforts being looked upon as more bureaucratic talk than real efforts with substance.

The mistake attributed to *Failing to Create a Sufficiently Powerful Guiding Coalition* is often the result of a change effort team, such as the Vector team, not having the required buy-in from the organization as a whole. Without this buy-in, it will be difficult to overcome the inevitable resistance to change at all levels within the organization. Kotter has observed that intelligent, charismatic individuals alone will not succeed in overcoming the norms and traditions that exist within the organization's culture; a team is a prerequisite, to even stand a chance. In order to build a successful guiding coalition, leadership must endorse and support the efforts of the team and must actively champion those efforts at all levels within the organization.

The common error of *Underestimating the Power of Vision* may result even if the prior examples of a lack of urgency and the lack of strong guiding team are adequately accounted for. Kotter explains that while leadership may put intricate plans in place for change, the change effort will not succeed without a realistic and sensible vision that the organization can relate to and understand. A vision must be clearly relayed to the organization for the purpose of instilling inspiration and unequivocal direction for the organization's members. Visions must be sensible. Kotter explains that many organizations overlook this concept and produce extremely detailed explanations of the change effort, but they fail to adequately or convincingly explain the compelling reasons for the necessity of the change. This almost always results in the opposite effect and turns the audience away from the cause instead of serving as inspiration. Kotter's rule of thumb for this common mistake is "Whenever you cannot describe the vision driving a change initiative in five minutes or less and get a reaction that signifies both understanding and interest, you are in trouble" (9).

The common error of *Undercommunicating the Vision by a Factor of 10 (or 100 or even 1000),* is made when organizations lack credible communication plans. As was touched upon in the discussion above on organizational culture, organizations are very resistant to change as change implies the need for sacrifices. Individuals may not be

willing to make these sacrifices, even if they are unhappy with the current situation or the results that are being obtained. Leadership and management must clearly communicate the importance and impact of the new efforts to the organization, and this must be done frequently and with conviction. Kotter's experience has demonstrated three patterns of ineffective communication summarized below:

- The change effort team develops a good transformation vision but pitches it to the organization by way of a few meetings or a few memos. The result is the change effort team is astonished to find that people do not know or understand the new approach.

- The organizational executive(s) spends considerable time presenting the change effort to employee groups but most managers are not included in the change effort speeches. The result is good communication to employees, but the volume of communication is inadequate.

- Significant communication effort is placed in newsletters and speeches but middle and high level management, or even highly visible organization members, blatantly withhold support, or as Kotter says "still behave in ways that are antithetical to the vision." The result is increased skepticism among employees and a significant decrease in support for the change effort.(9)

Ultimately, in order to ensure that this error is not made, change effort teams should carefully consider that changes will generally not be accepted without support from the "masses," and to achieve lasting change, all stakeholders must understand the vision.

Permitting Obstacles to Block the New Vision is an error commonly attributed to an organization's lack of empowerment to actually achieve change. The obstacles serve as roadblocks to change and are often inherent in the organization's existing culture as made evident…

- within the existing organizational structure;
- in the organization's old way of doing things and their influences (i.e., existing performance-appraisal systems); and
- in the failure or refusal of supervisors and mid-level management to adapt to new circumstances, what Kotter considers the worst aspect of all existing inherent organizational culture.

Though these obstacles seem logical or even expected, it is essential to note that in the past they have destroyed change efforts and yielded disastrous results. This has caused lower-level managers to lose faith in the transformation efforts and to mistrust senior management as they may have felt that they were misled regarding the actual vision behind the transformation. Obstacles that are not confronted serve as serious impediments to employee empowerment and increase the chances for failure of transformation efforts. Creating successful and lasting change often takes a significant amount of time. Successful change efforts will include plans that incorporate the gradual adoption of changes over time and a reward structure which supports this.

Failing to Create Short-Term Wins is a common mistake that many organizations fall victim to. However, if properly considered and accounted for by those championing the change effort, creation of short-term wins would assist in preventing the organization's members from giving up on the change effort too soon. Kotter explains that "most people won't go on the long march unless they see compelling evidence within six to eighteen months that the journey is producing expected results" (11). In order to accomplish successful planning for this error, efforts must be active and successes should be planned for (as opposed to being hoped for) by establishing short-term goals and rewards such as recognition, money, or promotions. When results can be seen and the benefits of the new effort are made tangible, the urgency for the change remains high. However, without visible results, the vision quickly becomes replaced with cynicism and the transformation's success is put in jeopardy.

Declaring Victory Too Soon is another common error, especially after attaining improvement in an area of the transformation. In this area, rewards may be given and celebration may take place too soon before the main improvements to the organization have yet to materialize. This premature celebration often results in the unintentional reversion back to "old ways" as the meaningful changes have yet to be engrained within the organization's culture. This error is closely linked to the previous one as leadership may attempt to capitalize on the first signs of improvement, but they actually go overboard in their celebration of short-term goals. Too much celebration can give the false impression that the necessary goals have been achieved and stakeholder enthusiasm

may begin to wane. It is vitally important for leadership to be aware of how closely these two items are intertwined and to plan for them accordingly in order to optimize results.

Finally, *Neglecting to Anchor Changes Firmly in the Corporate Culture* is an error made by organizations due to the lack of follow-through for efforts. In order to be fully engrained as organizational culture, the new processes of the transformation must continually be emphasized and applied until the organization views the efforts as second-nature. Kotter explains that there exist two factors for anchoring new processes – the first is demonstrating to the organization how the newly adopted processes, behaviors, and employee actions have directly improved the organization. These results and improvements would serve as irrefutable evidence of the effectiveness of the change effort. The second factor related to anchoring new processes pertains to ensuring that junior managers and the organization's future leaders are thoroughly informed of and integrated into the change effort. Kotter explains that in some cases, where the champions of change were retiring CEOs, their successors possessed neither an adequate knowledge of the change effort's development nor a sufficient understanding of the change effort. Unfortunately, this resulted in the inadvertent regression to old ways of doing things and the repetition of problems that the change effort aimed at correcting in the first place. Also, by not including the organization's future management and leadership in the planning of the transformation effort, the new leaders may underestimate the power of resistance to change that can lead to failure to anchor those changes in the organization's culture. Kotter explains that this is mostly due to a lack of understanding of the implications of cultural change and how this ultimately plays an extremely large role in transformation efforts within organizations.

Fortunately, Kotter explains that these errors, though very common, are preventable, or at least they are generally able to be mitigated. The eight common mistakes were the downfall of many change efforts that cumulatively spanned decades and that had been championed by many intelligent individuals. By understanding the true implications of organizational culture with respect to transformation and these common pitfalls, transformation teams can effectively plan for successful efforts that not only function as designed but will also achieve organizational acceptance.

C. OBSERVED ISSUES AND CHALLENGES TO DATE FOR VECTOR

In the beginning of this chapter, it was explained that the organization is a collective being that is complex and has cultural aspects that are very important to consider in respect to transformation efforts. Understanding the cultural implications of change, especially the inherent resistance to change of an organization, and the common mistakes of other organizations can greatly increase the probability of success for any change effort including the Vector project and its rollout to the ARDEC organization. As of this writing, the Vector project is about mid-way through the design process and much can be done to ensure Vector does not fall victim to the common mistakes explained above. In the next chapter we focus on what can be done by ARDEC to maximize the success of Vector. Here, we identify the observed issues and challenges facing Vector from an organizational culture perspective based on an understanding of the kind of change that Vector would bring to the ARDEC organization and on the common observed errors discussed above.

1. Communication of Vector to ARDEC

Based upon the authors' observations to date, the Vector team has worked its way through the design effort; however, as the team nears the end of design work and approaches Vector's deployment to the greater ARDEC workforce, the ability to effectively transfer this process to the ARDEC workforce is rapidly becoming an issue that the team recognizes must be considered and planned for—as soon as possible. The Vector team, obviously, is aware of the importance of Vector to ARDEC, and most of the leadership understands what this new process entails as they have been updated on Vector's status throughout its early stages of development. Similarly, a few stakeholder representatives are familiar with all of the work and effort put into the design of Vector thus far, mostly due to their involvement in feedback sessions in the previous development phases of Vector. However, what about the rest of the organization? How can they be brought up to speed on all of the important details that comprise this transformational project? This is the premise of one of the major concerns facing the

Vector team and can be summed up as follows—***How can the Vector team effectively communicate the importance of Vector to ALL of the stakeholders (internal and external)?***

As the Vector project nears its rollout to the greater organization, some key areas of design are still required, many of which will depend exceedingly upon support and feedback from many representatives across ARDEC and its customer base. To date, stakeholder feedback sessions have been an important aspect of Vector's design but organization representation has been something that has been difficult to attain as previously witnessed by lower than expected levels of attendance at these sessions. Additionally, upon deployment of Vector, the team understands that the current engrained culture and "old ways of doing things" will be one of the most difficult obstacles that Vector faces. After all, as was discussed above, the collective minds of an organization do not acclimate to change as easily as an individual or smaller group would. The momentum generated by the general acceptance of Vector by the greater organization would provide the support and endorsement required for Vector's success, especially during its initial rollout phase. But how can the Vector team harness this power from the organization? This area of concern could be summed up as—***How can the Vector team garner the support from the greater organization (ARDEC) and customers that is required both during design and after deployment?***

2. Vector Implementation Planning (Post-deployment, Enforcement)

Breaking away from old methods and habits is never an easy task, especially on a collective scale as in an organization, but for Vector to yield all of its planned benefits to ARDEC, change will be necessary. That change may not only be in the form of processes and methods of completing tasks, but may also include changes to the structure and alignment of ARDEC personnel within the organization, the re-shuffling of tasks that certain members will now carry out and be responsible for, and even changes to how the performance of members is evaluated—to include the role of compensation and rewards. Without these changes, the existing methodologies and structure within the organization may slow down the acceptance of Vector processes, serve as a barrier that impedes

Vector's success, or in the worst scenario, kill the project altogether. ***How can the Vector team prepare for any resistance based on culture?***

In the long term, the changes and positive outcomes of Vector are meant to be enjoyed by the organization for many years to come. It should not surprise Vector team members if Vector's integration and complete adoption by the organization takes many years. Vector itself may need to be continually fine-tuned as Vector and ARDEC grow together. The last thing that would be desired would be for many of the core requirements of Vector to be derailed or undone during this growing phase- a possibility considering that many of the team members and endorsing executives will have transitioned out of their current roles. So, another major area of concern is—***How can the Vector team ensure that Vector maintains adherence to its vision in the years after initial deployment?***

Finally, Kotter's observations of common errors related to organizational change and cultural considerations should not be taken lightly, especially since Vector is rapidly approaching rollout to the greater organization. This begs the answering of the question- ***What else should a change effort like Vector be worried about as far as Organizational Culture?***

Understanding the organizational complexities related to culture and change is important when considering any efforts for improving the way business is conducted within an organization. Change efforts can range from relatively small business improvements all the way through to a detailed revamping of processes. Careful thought and detailed design considerations should be included in each case in order to successfully reach a new and better end-state for the organization. Oftentimes, the careful planning and analysis carried out in support of a change effort will lack fundamental concepts and considerations pertaining to organizational culture. The importance of planning for these aspects of organizational culture is easy to underestimate or to neglect and this often results in failure of improvement efforts. By understanding an organization's cultural response to change, types of organizational changes, and common pitfalls encountered in history, an organization, such as ARDEC, is equipped with the necessary tools to maximize success during rollout of a change effort

like the Vector project. In the next chapter, we will focus on identifying the guidelines to follow and the recommendations to implement to ensure Vector's success. This will be accomplished by carefully planning for the common errors discussed in this chapter and by identifying potentially deficient areas currently observed within Vector that may require extra attention.

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IV. ORGANIZATIONAL CHANGE CONSIDERATIONS FOR SUCCESS

A. CONSIDERATIONS FOR SUCCESS

Kotter's eight common mistakes, identified in the previous chapter, constitute the major areas an organization should carefully consider in change efforts. In this chapter, we expand upon the eight common mistakes and translate these into steps that aim to serve as organizational change considerations for success. Additionally, the steps, or stages, are focused on the ARDEC organization and the application of these to the Vector project. Organizational change may demonstrate some differences between private and government/non-profit organizations. ARDEC and Vector serve here as excellent models of a government organization and a major change effort, respectively, in order to analyze the application of Kotter's eight steps for creating major change to these types of organizations.

The eight common mistakes identified in the previous chapter can be translated into steps for effective organizational change, which Kotter calls "The Eight-Stage Process of Creating Major Change," shown in Figure 9.

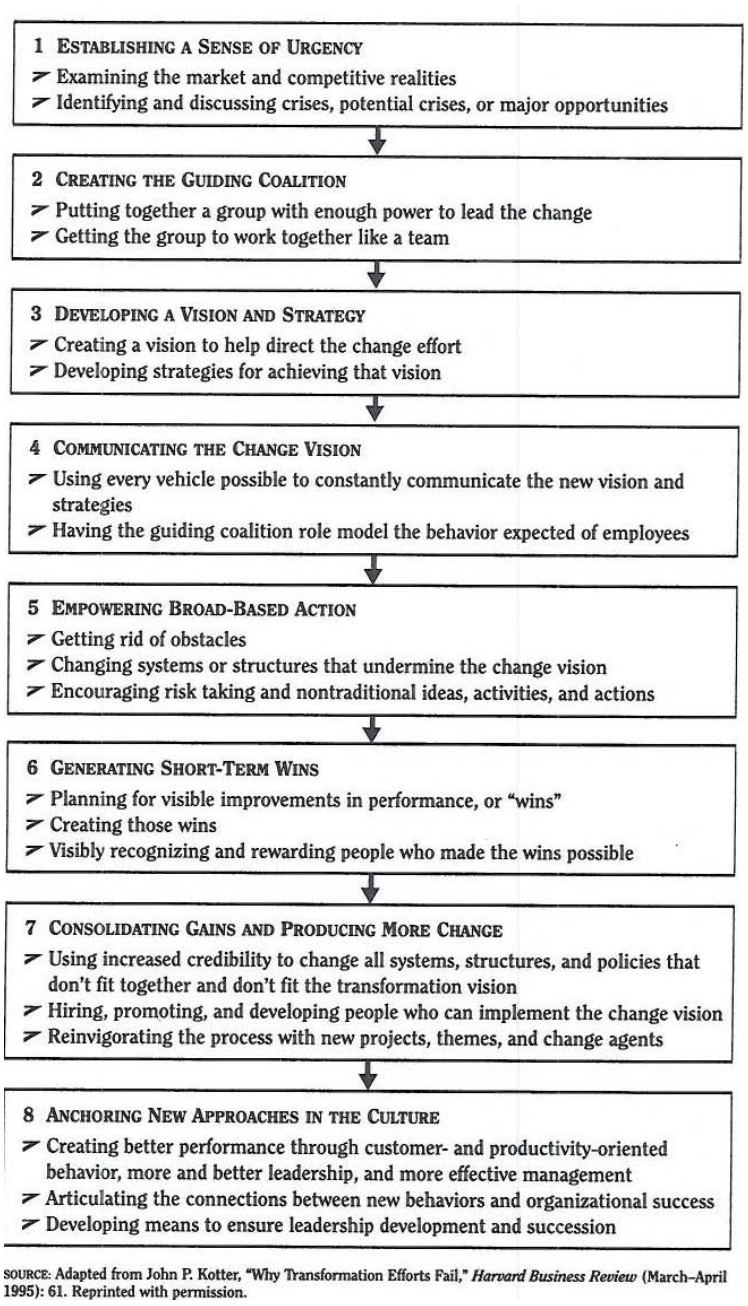


Figure 9. The Eight Stage Process for Creating Major Change (From Kotter)

Historical observations have shown the need for the adequate completion of the stages in the sequence depicted and failure of this rarely is found to result in success. According to Kotter, people under pressure to rollout a change effort, tend to skip over stages often resulting in the need to go back to address the prior stages. In the following paragraphs, each of the eight stages is briefly described and applied to the Vector project

and the ARDEC organization based upon the project and cultural discussions in previous chapters, and the authors' observations of the current state of Vector.

B. THE STAGES FOR CREATING ORGANIZATIONAL CHANGE

1. Stage 1 - Establishing a Sense of Urgency

a. Stage 1 - Description

The need for establishing a sense of urgency is the first of the stages that aims to begin to "defrost a hardened status-quo" and specifically tackles organizational complacency head on, which is the largest obstacle for a change effort (22). Establishing urgency for the entire organization is essential as it instills the reality and truth of the issues of an organization that is often understated by executives, intentionally or not. Having all organization members understand the need and the repercussions for not changing its ways instills the much needed alliance and cooperation from all, essentially bridging the gap of understanding between the founders and proponents of the change and the rest of the organization. It also allows for a drastically more positive reception to a change effort upon its roll out to the organization. Ironically, though most organizational executives are the founders of a change effort, as they are often the first to see the need for change, they are often the source of creating such high complacency. Failure to fully portray the organization's deficiencies and the corresponding consequences of not changing are the true sources of complacency, both directly and indirectly.

According to Kotter, the "power of the subtle and systemic forces that exist in virtually all organizations" is often underestimated and writes that a good rule of thumb is to "Never underestimate the magnitude of the forces that reinforce complacency and that help maintain status quo" (42). Taking a look at the sources of complacency shown in Figure 10 helps graphically depict why it is so difficult to change the culture of an organization.

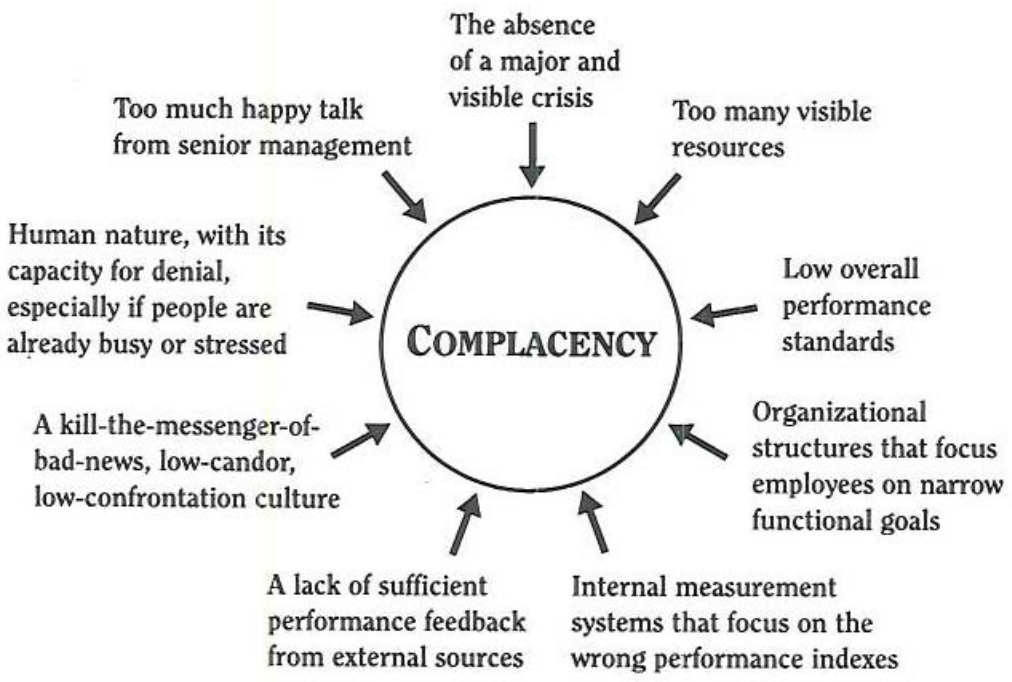


Figure 10. Sources of Complacency (From Kotter)

Addressing all of these areas may involve a complex effort that is outside of the realm of this paper, but the sources are presented here to demonstrate the reasons for such complacency and to suggest that change efforts can be accomplished with tremendous success but, for these reasons, is often a very difficult, and much underestimated task.

b. Stage 1 - Application

Relevant to ARDEC, this particular organization has seen tremendous success and has received a number of recent accolades that are prominently displayed, and rightfully so, for instilling success to its members. Unfortunately, these successes may provide a false sense of security and a source of complacency supporting negative views against projects like Vector, such as "why should we adopt Vector if the ways things are done now are just fine?" Town hall meetings are conducted and highlight the new developments taking place at ARDEC, but may not adequately or clearly communicate the areas of deficiencies, which is crucial for conveying the reality and

need for change. Furthermore, meetings with executives or select organization members are used to explain the positive aspects of the organization as opposed to the negative, which increases complacency altogether.

So, one would ask, "Do the banners and trophies have to be taken down and replaced with banners and signs of the negative and poor performances of the organization?" According to Kotter, the answer to this may very well be, "Yes!" In order to establish a sense of urgency, bold moves are required to shake up the years' worth of complacency. But these bold moves are not seen often in industry or may be referred to as insensible by executives and managers—often viewed this way due to years of an "overmanaged and underled culture," according to Kotter (43). This results from decades of a culture that rewards caution by its supervisors.

There are a number of ways urgency can be raised within an organization, many of which can be considered bold, but nevertheless, may be worth considering for ARDEC and the successful rollout of Vector. Since the Vector project is an effort aimed at addressing ARDEC—wide efficiencies for improved product and process development, it seems the most important aspect relative to instilling urgency for ensuring Vector success is that of communicating the importance of this effort to all. According to Kotter the need for change, such as what Vector would bring about, must be understood by all and the "happy talk" must desist (44). Honest discussion of the negative issues and problems the organization faces need to be constantly directed toward employees through such media as ARDEC's newspaper, newsletters, internal websites, and senior management speeches. Instead of proclaiming the resounding success that Vector will bring, ARDEC should focus first on communicating the areas that are problematic, and the associated consequences of leaving these problems unchecked. Furthermore, the tremendous opportunities and rewards that ARDEC would achieve and why the organization cannot reach them must be communicated to demonstrate the goals and instill the esprit de corps that is needed for change. It is only then, when the workforce understands the urgency of the change, that the ARDEC stakeholders will embrace project efforts such as Vector. More is discussed on the communication of the vision of Vector in the stages to follow.

2. Stage 2 - Creating the Guiding Coalition

a. Stage 2 - Description

According to Kotter, in order to successfully accomplish an organizational change effort, a strong coalition of individuals is needed in the organizational change team—a team that should possess the appropriate level of trust by the rest of the organization and also demonstrates the same objectives by all members. There are two common pitfalls associated in creating this coalition—first, is a common misconception that one key individual such as the CEO of an organization is all that is required for building and rolling out a change effort. Although this one individual may have tremendous experience and know-how of the organization, there exist too many elements of change and the rate of change of the environment is too fast and complex, especially today, that would require a team of talented individuals at a minimum, looking over each and every aspect of the change effort and its implications to the organization. Another mistake made is having a team of individuals whose members have low credibility in the organization—although there may be the CEO in that particular team, the "top brass" members of the organization may be missing but are required. If only one or a few of the top officers of the organization are members, the rest of the team loses steam quite fast and limits their assistance and true role in the transformation effort. The one or few top members of the team may be able to push the effort longer but, without the support and credibility of its team members, they eventually will fail along with the change effort. According to Kotter—"Without the credibility, you have the equivalent of an eighteen-wheeler truck being propelled by a lawn mower engine" (54).

Creating a guiding coalition is difficult, mostly because it involves finding individuals from the organization that not only demonstrate expertise in the relevant areas, and possess the necessary credibility but also requires finding individuals that possess the management skills to control and monitor the change process. Most importantly, individual leadership skills are needed to drive the change, this being the most important factor in determining success of the change effort. Figure 11 provides a check-list for building a strong guiding coalition according to Kotter.

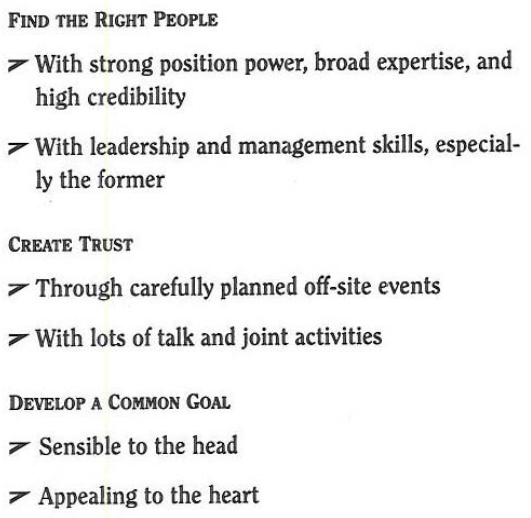


Figure 11. Guidelines for Building a Coalition (From Kotter)

It is useful to note here, that all of this effort may not necessarily be required for organizations in which their environments are not as susceptible to fast-moving change of requirements and customers, but since this is the case for most organization's today, they are presented here and identified as a key step to consider in creating a change effort.

b. Stage 2 - Creating the Guiding Coalition–Application

Turning our attention back to our model organization, ARDEC, and the Vector team, we can note that this is a strong area in the quest for organizational change. The Vector team consists of individuals from all over the organization, serving as representatives of their respective directorates offering a broad expertise for Vector project input. These representatives are often upper management and leaders in their areas; therefore, Vector has done an excellent job in finding the right people for the coalition. The remaining areas of creating trust and developing a common goal have been considered but may require some re-enforcement; however, this area seems to be addressed as the Vector project is progressing, based on the author's observations. This has been made apparent by the open-door policy that the Vector team has instilled from the beginning, in which anyone that is interested can participate in a Vector meeting and, if interested, can become a Vector team member, regardless of where he or she may come

from in ARDEC. Also, since many other efforts relevant to Vector are in process but specific to other areas within the organization, there has been a recent and proactive effort to share information that has served to dispel mysteries surrounding other major efforts and has established a sense of partnership. This has been observed to have been made possible by Vector's diverse team membership which has resulted in individuals from other Vector-like projects and infused a sense of teamwork across teams. The guiding coalition that comprises the Vector team seems to be steering in the right direction, but whether or not the direction is leading to the correct vision is discussed in the next stage.

3. Stage 3 - Developing a Vision and Strategy

a. Stage 3 - Description

Kotter explains that a simple rule of thumb for an organization's vision is "if you cannot describe your vision to someone in less than five minutes and get their interest, you have more work to do in this phase of the transformation process" (78). According to Kotter, there are three methods or strategies for breaking through the resistance that support status quo, and one has been the tried and demonstrated approach with the most success—that is Vision. The three approaches for breaking through organizational resistance are Authoritarian Decree, Micromanagement, and Vision. The best method of explaining these is borrowing from Kotter's apple tree analogy. Imagine three groups of ten individuals, each group representing the three approaches mentioned above. The Authoritarian Decree would call for the leader saying to a group, "Get up and follow me to that apple tree, NOW!" The Micromanagement group would have its leader explain, "You are all to get up, proceed approximately 20 steps, turn right, and take four steps, maintain two feet of space between members, and await further direction at the base of the tree." Whereas the Vision group would have its leader state "It is about to rain, let's all walk over to the apple tree for shelter, there, we will be able to stay dry and have fresh apples for lunch." The analogy makes it very clear that the Vision approach is the most effective at not only motivating members to deal with some pain of going outside the ordinary, but offers the vision and hope of why the pain is necessary and

makes the change happen with the least possible confusion, doubt, and resistance. That is exactly the reason why vision is so crucial in organizational change efforts.

The creation of a vision is not easy but once created, the organization and all of its members would be able to understand and cope with the change, apply the vision to day-to-day decisions and actions, and collectively emerge as an organization that is on-pace or ahead of the changing environment. With a vision serving as the way-point for all, the minutia of what is required to get there is left up to organization's members who will each individually see how to best adapt to a given environment in order to reach the vision's goals. Figure 12 shows Kotter's characteristics of an effective vision, in which he states, are good to keep in mind during the difficult process of creating the vision.

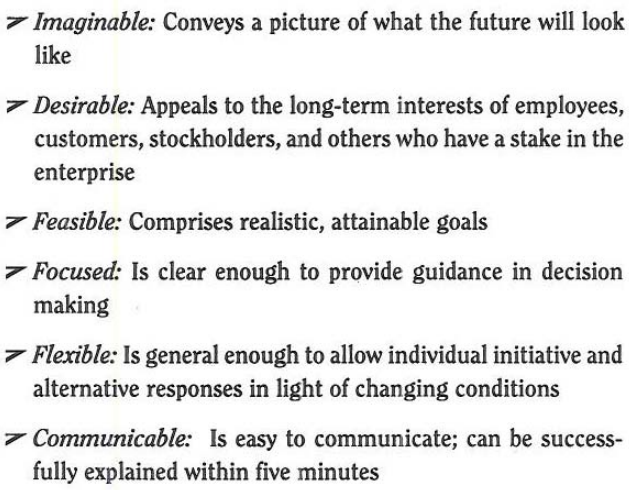


Figure 12. Characteristics of an effective vision (From Kotter)

It is essential to keep in mind that a weak vision is better than no vision when it comes to transformational change with the only caveat being that a Vision is powerful and when not accurate can lead the organization astray from the intended goals. Also worth noting is that this stage, just as in the rest of the stages, should be finalized preferably before continuing on as efforts will only become worse if developing a vision and strategy is left out.

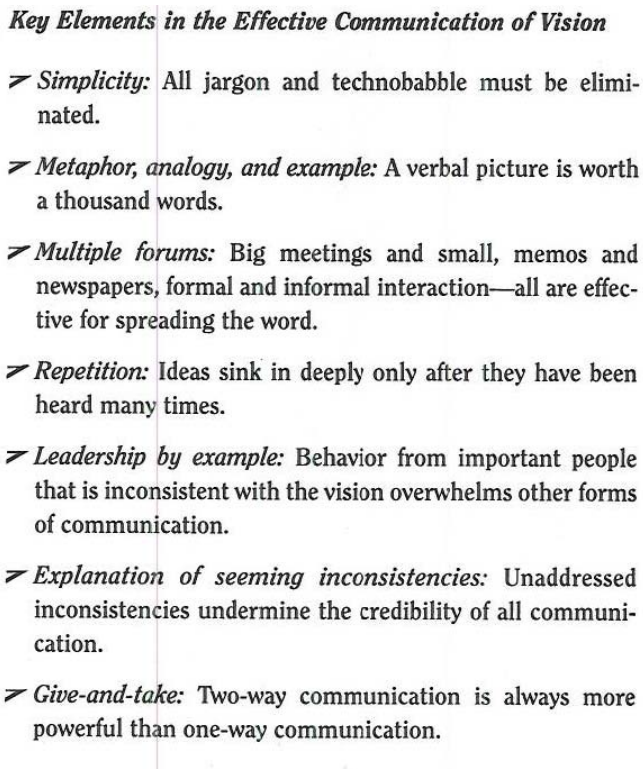
b. Stage 3 - Developing a Vision and Strategy–Application

For the case of the organizational change effort that Vector stands to become, the vision for Vector must be fully developed considering the characteristics of an effective vision shown above. This may be a stage that must be considered immediately, considering the progress of the Vector project and to prevent the de-railing of progress already made. The entire Vector team's support is required to develop the vision in order to ensure that an imaginable picture is painted to ARDEC with desirable outcomes that are shown to be feasible, focused, and flexible and, most importantly, that can be communicated to all ARDEC stakeholders in less than five minutes. It is for this reason that creation of a vision is a difficult task requiring the combined efforts and experiences of all team members that may take months to finalize, but this stage serves a crucial step for ensuring success of Vector. Another motivation for adopting an effective vision is to consider that "customers rarely tolerate producers that are not focused on their interests" (73). Many Vector team members fully understand that the customers, mainly the Program Management Offices, need to see clearly the value in Vector for their continued business with ARDEC. Considering this, a poor vision may very well result in a weak deployment of Vector and not only would the customers' support for the Vector project dwindle away and die off, but their view of the organization may be at stake and their tolerance of ARDEC's lack of focus may be negatively affected. The same may be said for other customers and partners of the organization. In contrast, if the Vector team is successful in creating and portraying an effective vision, the organizational members and the customers would understand the importance of an effort such as Vector and see the benefits associated with it. This would translate to their additional support early on by way of assuring stakeholder feedback, assistance in design, and support in the rollout of the effort- all of which would contribute to successful adoption of this transformational effort.

4. Stage 4 - Communicating the Change Vision

a. Stage 4 - Description

One can see here the importance of following the sequence of these stages as communicating the change vision would not be possible without an effective vision in place. The true value of an effective vision can only be unleashed when it is known and understood by all members, and this is where many organizations fail, especially in large ones, but often is attributable to failure in the first three phases. The task of creating a vision is exceedingly difficult as mentioned in the prior stage because it deals with difficulties in two realms—intellectual (the strategic aspects of the vision) and emotional (the breaking from the status quo). The questions that will likely be asked by all organizational members regarding the change must be answered by all in the guiding coalition before-hand and all of this must be communicated effectively. Kotter offers key elements for this effective communication of vision, as shown in Figure 13.



Key Elements in the Effective Communication of Vision

- ***Simplicity:*** All jargon and technobabble must be eliminated.
- ***Metaphor, analogy, and example:*** A verbal picture is worth a thousand words.
- ***Multiple forums:*** Big meetings and small, memos and newspapers, formal and informal interaction—all are effective for spreading the word.
- ***Repetition:*** Ideas sink in deeply only after they have been heard many times.
- ***Leadership by example:*** Behavior from important people that is inconsistent with the vision overwhelms other forms of communication.
- ***Explanation of seeming inconsistencies:*** Unaddressed inconsistencies undermine the credibility of all communication.
- ***Give-and-take:*** Two-way communication is always more powerful than one-way communication.

Figure 13. Key elements in the effective communication of vision (From Kotter)

The communication of the vision must be focused on keeping it simple for all organization members to fully grasp it (i.e., not just the engineers, managers, or accountants) and must use easy to understand language that metaphorically paints a detailed picture with the use of as few words as possible, since a picture (though in one's head) paints a thousand words. All forums of communication must be capitalized whether they be town-halls, meetings, or even posters, emails, newsletter, or ad space in the organization's newspaper—if time and cost for this is identified as an issue, than the guiding coalition is not looking closely enough at all of the opportunities for communication that may be available. Repetition is obviously key for engraining vision, but the forums mentioned above should not be the only source of repetition; rather, the strength of the organization's numbers should also work for the change effort by assuring all executives, leads, and managers constantly tie in the vision at staff meetings, status briefs, and the like. Finally, addressing issues immediately and before they spread negativity is the basic premise for addressing inconsistencies explicitly but never disregarding the feedback of the organization if specific issues are constantly being brought up.

b. Stage 4 - Application

It seems that public agencies, similar to ARDEC, do not fully take advantage of visions and even less their communication mechanisms. Visions often get interchanged with mission statements and do little for painting a picture of what the direction of the organization is. As mentioned earlier, this situation cultivates a culture of complacency and one of high resistance to change that works against important projects such as Vector. When it comes to communication, much more can be done to provide for the communication of the vision and the repetition to engrain a new overall goal to the entire organization. Agencies such as ARDEC, like private organizations, utilize forums such as town-hall briefings from the director/CEO/president, or memorandums for record emailed to the members or posted in managers' offices. These typical forums for exchanging information can and should be used to shed light on the vision and results that projects, such as Vector, stand to deliver. However, more should be done to provide for the required repetition of the message that is needed for effective organizational

transformation. Generally, all of the key elements in the figure above can be followed by an organization such as ARDEC, but in an environment where there is bureaucratic inertia with little that ARDEC can do to change this, forums that are informal offer a unique strategy for communication that can provide for repetition without unnecessarily straining its members further (after all, there is less and less time in the day for actual work considering all of the required training, much less forcing the workforce to sit in on a transformational effort briefing). Ad space in ARDEC's newspapers, posters at the recreational facilities and cafeteria, concise electronic messages via email and website presence all would provide for other-than-the-usual approaches whose uniqueness alone would entice ARDEC members. And in keeping with the previous stage, the message to be communicated should be the vision, not a detailed explanation of the Vector process. But as was stated at the beginning of this stage, a vision is required to ensure the right picture is being painted for all employees and, likewise, if people cannot seem to relate or accept a vision communicated to them then the prior stages should be closely looked at and possibly revisited. Otherwise, the next few stages will likely fail as well.

5. Stage 5 - Empowering Employees for Broad-based Action

a. Stage 5 - Description

Kotter's research has shown that it is rare for significant or lasting change to occur within an organization without the efforts and action of many within the organization. Establishing urgency, providing guidance, and promoting a clear vision of change is all well and good, but without giving the employees the freedom to implement the necessary efforts through real empowerment and the removal of obstacles to that empowerment, the organization will be unlikely to accomplish or sustain meaningful change.

The four biggest obstacles to empowerment include: structures, skills, systems, and supervisors as depicted in Figure 14.

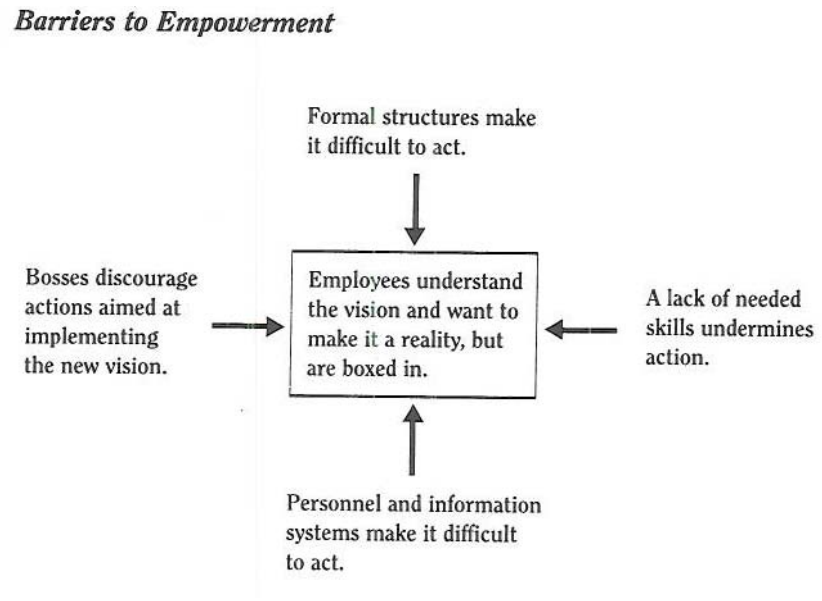


Figure 14. Four barriers to empowerment (From Kotter)

Organizational structure can have a significant impact on the ability to implement a new vision. While management may talk a big game about the new goals for the organization and empowering the employees to accomplish these goals, it will most likely be just that, talk, unless structural obstacles are removed. It is inevitable that existing structures (such as managerial organization) that have been in place for years may be counter-productive to new efforts. Employees may be told and encouraged to perform tasks differently in order to implement the planned changes, but if management is not realigned to coincide with these new methods then the change is likely to stall. Without structural changes, existing reporting procedures and approval processes will stand in the way of the new ideas and actions for which the organization is striving. The easiest way to overcome the structural obstacle may very well be to completely re-organize in order to remove unnecessary layers of management that will impede the execution of new processes.

A lack of proper training and skills must be accounted for in a major change effort. If an organization is attempting to significantly change the tasks performed by many employees it needs to consider what new behavior, skills, and attitudes may be needed to accomplish those tasks. The organization must provide the

necessary training and in adequate quantity to assure that employees have the proper skills to perform their new functions. If not, there is a risk that frustration and annoyance with the new processes can completely derail the change effort as employees may become apathetic or even vindictive in regard to the change.

Systems such as management information technology (IT) and human resources (HR) can be obstacles when they are not changed to align with the new vision. New tasks and processes will require new management IT systems to properly track and quantify results. HR appraisal systems must be changed to align ratings and awards with the new goals the organization is trying to achieve. Employees may be encouraged to perform new tasks or to take new risks in order to implement the proposed changes within the organization, but without a corresponding update to appraisal methods, the employees will inevitably act in their own best interest and continue to perform in a manner that corresponds to the existing rating structure.

Finally, even if an ideal vision and an excellent communication plan are in place, critics may remain that can derail the change process. Just as the workforce can be used as a powerful means to adopt the change, critics, especially in supervisory and managerial levels of the organization, can pose a significant barrier to successful transformation efforts. The ideal manner to address these individuals is quite simply to confront them directly and to have an honest discussion with them regarding why the proposed changes are necessary to the organization. The individual will either be able to align himself with the plan or an acceptable alternative should be developed that will prevent him from remaining an obstacle to the change.

b. Stage 5 - Application

Organizational change efforts are in depth, detailed and designed with much invested, as in the case of the Vector project. However, the effort is not the only place where the design must be placed, but also in the structure of the organization if it is deemed as a potential obstacle to change. If a change is required, then the people must be set up so as to eliminate any structural barriers that may take place. In Vector, if the ARDEC Project Officers will serve as empowered individuals with tremendous

responsibility for successfully passing through gates and proceeding into the next process steps, then the structure must be organized so as to prevent any unneeded layers of middle-level managers that may stand in their way. If management is in place that may serve to second-guess, criticize the ARDEC Project Officer's efforts, or worse, reprioritize their efforts so as to go against the Vector process, then a restructuring of the organization will be required.

One of the areas that have been discussed among Vector team members is the need for training of employees about the Vector process, and rightfully so since lack of training can understandably be seen as an obstacle toward change. One thing worth considering by the Vector team is not only what kind of training would be required but also to be aware of what this new training would translate to in terms of time and money. The team should be able to carefully study the types of skills and knowledge that would be essential for Vector to identify the training that would be needed, for how long, and to whom. Furthermore, with an eye toward what that would mean in terms of time and cost investment, the team can be creative in the design of the educational experiences to be delivered.

Another area that has been discussed in Vector team meetings is the alignment of systems to Vector. Sure, the IT systems may be in place, which is one of the areas where a significant amount of design was applied to including information sharing, documentation of best practices, but the alignment of HR-related systems, for example, may be an area that Vector team members may not have paid its due attention, based on Kotter's historic observations. Specifically, the Vector team must ensure that performance appraisals, compensation, promotions, succession planning all can be tied into the Vector vision otherwise Vector may lose the support of ARDEC's members almost immediately. This area is essential for providing that crucial incentive that would keep ARDEC members truly in sync with the vision of Vector.

And finally, the Vector team must keep in mind that many members, especially supervisors, and managers, will resist change from Vector not only because they do not agree with the changes, but rather because they simply have been so engrained with the old way of doing things for so long. Kotter explains the best manner

of dealing with this is to simply identify and confront these individuals in a manner of understanding their perspective to better explain the vision to them. Time and resources should be planned for and be ready for instances such as this in order to not disrupt the rest of the progress of Vector once it is deployed to the organization.

6. Stage 6 - Generating Short-term Wins

a. Stage 6 - Description

Major change efforts can take a significant amount of time to fully develop from concept to reality. Leadership can sometimes get caught up in the big picture or lost in their grandiose vision of change and as a result fail to focus on planning for the short-term wins necessary to keep all of the stake-holders onboard and motivated. Short-term wins are necessary in order to build the credibility needed to sustain change efforts over the long haul.

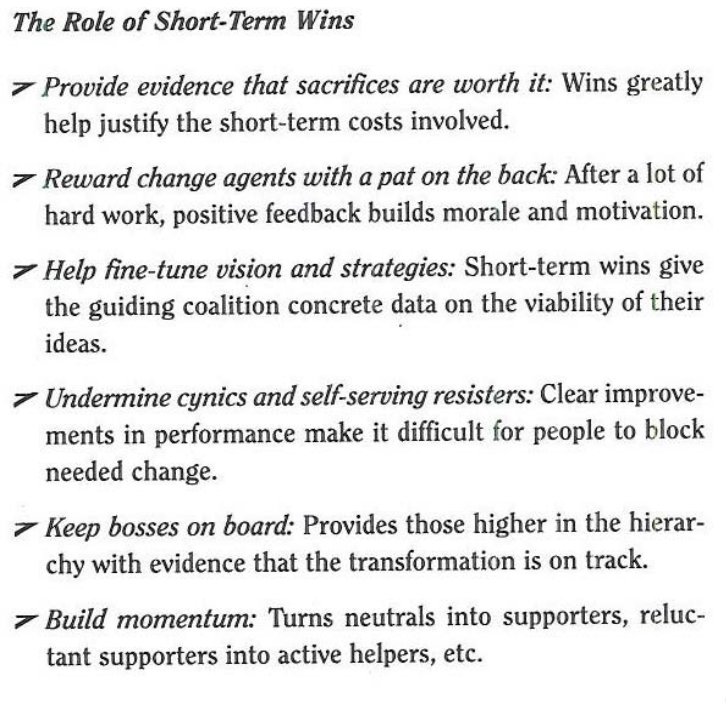
Real change is a long and continuous process. There are many true believers who understand this, and will strive to reach the goal, no matter what. Many others in the organization expect to see some sort of results to justify their hard work. Finally, there are the real dissenters. They are even more demanding in regard to seeing proof that the change effort is bringing the benefits that have been claimed. Short-term wins will go a long way toward quieting and possibly even turning some of these voices of dissent into supporters of the effort.

Many different activities take place while undertaking a major change effort. In order for a result to be defined as a short-term win for our purposes, it should have three characteristics:

1. It should be visible and large numbers of stakeholders should be able to see for themselves that the result is real and not hype.
2. The result should be unambiguous.
3. The result should be clearly related to the change effort. (121–122)

Planning for and producing short-term wins that meet these criteria will go a long way towards ensuring the success of the transformation process.

Now that we know what criteria should be met to determine if a result is a short-term win, we can look at what role short-term wins play in the transformation effort. Kotter explains that short-term wins help the organization's efforts in at least six ways as shown in Figure 15.



The Role of Short-Term Wins

- ***Provide evidence that sacrifices are worth it:*** Wins greatly help justify the short-term costs involved.
- ***Reward change agents with a pat on the back:*** After a lot of hard work, positive feedback builds morale and motivation.
- ***Help fine-tune vision and strategies:*** Short-term wins give the guiding coalition concrete data on the viability of their ideas.
- ***Undermine cynics and self-serving resisters:*** Clear improvements in performance make it difficult for people to block needed change.
- ***Keep bosses on board:*** Provides those higher in the hierarchy with evidence that the transformation is on track.
- ***Build momentum:*** Turns neutrals into supporters, reluctant supporters into active helpers, etc.

Figure 15. The role of short-term wins (From Kotter)

Short-term wins can go a long way toward greatly increasing the chance of success in a significant transformational effort. It will be beneficial if leadership and management are both on the same page in deciding upon what short-term wins to pursue. Strong leadership can motivate and focus employees on the long-term and the big picture, but management has the experience and the knowledge to track and measure results necessary to produce short-term wins and to keep employees motivated during what can sometimes be a challenging process.

b. Stage 6 - Generating Short-term Wins–Application

In our application to the Vector project, the Vector team must seriously consider the idea of generating short-term wins in order to win over the skeptics and provide the momentum needed to continue the success of a process, as Kotter states. Obviously, the short-term goals to use as 'wins' are dependent upon the change effort, but one potential area that may reap success enough to boast to all stakeholders may very well be in pilot programs running through the Vector process. Pilot programs are being considered by the team to iron out any unforeseen kinks in the process, but may offer an excellent case with plenty of data available to possible skeptics of any aspect of Vector. Any other 'wins' associated with clearly and visibly demonstrating the achievement of what the Vector Vision is about would accomplish the intent in this stage. Also worth considering would be to plan for short term wins to take place within 18 months of rollout, as Kotter identifies this timeframe as the most effective for large organizations such as ARDEC.

7. Stage 7 - Consolidating Gains and Producing More Change

a. Stage 7 - Description

Kotter's research has led him to the conclusion that an organization's engrained culture is one of the biggest obstacles to successfully implementing and maintaining change. Because it can take a long time to bring about change in large organizations, the leadership must be aware of the existing culture and how the 'old methods' of doing things can hamstring the process if unchecked. While short-term wins are necessary to keep stakeholders on board and moving forward with the change effort, leadership must be careful to moderate the level of celebration of these wins. If too much emphasis is placed on these wins, it can cause those who are involved to think that they have done enough and their enthusiasm for the change effort could wane. This is not how long term and successful change is implemented. A constant application of the 'new' change must be emphasized, so that it eventually becomes part of the culture.

As in nature, equilibrium is a barrier that is tough to breach. There will always be some resistance to change efforts and without a consolidation of gains and leadership emphasis on moving forward with more change, regression may occur. Once regression is allowed to occur it can be very difficult to re-energize the passion within the organization and among stakeholders that was created early in the process. Successful change requires leadership that can use short-term wins to motivate stakeholders to continue moving forward to achieve further goals. Effort must be applied to prevent complacency after a short-term win and instead using that win to motivate further action.

Also affecting the ability to continue producing lasting change within an organization is the interdependence of many existing systems. Simply put, a change in one area usually results in an unintended change or a required change in another area. An important first step in the process is for leadership to analyze the existing systems and to identify and eliminate as many interdependencies as possible. By eliminating interdependencies prior to beginning change actions the process will be simplified. Successful change usually requires many different small change efforts to be happening simultaneously. Again, this is where leadership has to take the proper actions and to delegate authority appropriately. Micromanagement from the top will inevitably fail as the proper amount of attention cannot be given to all of the ongoing efforts. Strong leadership, possessing a well devised plan for change, will analyze the overarching processes early and will understand that multiple changes will be overlapping. Proper delegation of responsibilities to the lowest levels possible will be necessary in order for all of these changes to coincide and to align themselves properly as the overall effort moves forward. Figure 16 describes a successful change effort at this stage.

What Stage 7 Looks Like in a Successful, Major Change Effort

- *More change, not less:* The guiding coalition uses the credibility afforded by short-term wins to tackle additional and bigger change projects.
- *More help:* Additional people are brought in, promoted, and developed to help with all the changes.
- *Leadership from senior management:* Senior people focus on maintaining clarity of shared purpose for the overall effort and keeping urgency levels up.
- *Project management and leadership from below:* Lower ranks in the hierarchy both provide leadership for specific projects and manage those projects.
- *Reduction of unnecessary interdependencies:* To make change easier in both the short and long term, managers identify unnecessary interdependencies and eliminate them.

Figure 16. Characteristics of a successful change effort at Stage 7 (From Kotter)

b. Stage 7 - Application

Whether or not the team understands at this early phase of the Vector project, Vector will have far reaching effects within ARDEC that will keep its leadership very busy for an extended period of time after rollout. As Kotter explains, the introduction of change in a large organization, such as ARDEC, takes a long time and therefore the team and ARDEC leadership must be careful to curb the celebration of any short-term wins such as a successful Vector Pilot program or even the first successful programs that implemented Vector. It may sound unworthy of consideration at this point in the project; however, the destruction of the sense of urgency for change that was so difficult to create in the first place, may serve as an opportunity to resist any attempt to undermine all progress. Therefore, it is imperative to plan for reaching a balance between excessive celebration and too little rewards. The success of the project may very well progress through the organization, while a well-planned change effort will adequately account for the rewards and incentives for the organization's members.

Furthermore, the Vector team needs to carefully consider the interdependence of ARDEC's organizations because, as mentioned above, changing one area or function within ARDEC will translate to change to any and all of the interdependent functions. For example, changing the role of the Systems Engineer at ARDEC will very well affect the role of the design engineer, especially if the latter was the one that assumed the tasks of the former in the "old way of doing things." Similarly, the addition of roles such as Gate-keepers will surely affect other areas such as the workload of these personnel or other interdependent functions and must be carefully considered.

Therefore, careful planning should begin early to better prepare ARDEC leadership for the long road that remains after rollout, carefully modifying organizational structures and roles of personnel, performance appraisal systems, and even eliminating unnecessary components within ARDEC, especially those that are inconsistent with Vector. As the organization progresses, the short term wins will help carry along the additional changes, and will provide the necessary momentum and credibility for continuing to propagate Vector. Also worth noting here is the importance of the role of leadership in this stage in the change effort. The role of leaders and managers should be focused on by the Vector team, because numerous efforts associated with the change are occurring at the same time, which often require management delegation.

8. Stage 8 - Anchoring New Approaches in the Culture

a. Stage 8 - Description

Building on stage 7 to produce meaningful and lasting change within a large organization, requires a firm commitment to the new methods and procedures that have been put in place as part of the change process. The biggest obstacle to tackle at this stage is the existing culture within the organization. An organization's culture may not be able to be laid out in writing like a vision or a mission statement, but it is a real and tangible thing nonetheless. As was discussed in previous chapters, culture is developed over time and becomes apparent in the way things are done on a daily basis in the organization, as well as the interactions between employees, and the way the organization deals with its customers. While the new changes are exactly what an

organization might need, if the culture does not align with the changes, it will take significant effort to make the changes stick.

Leaders should understand the effect that culture has on the employees and the organization and they should be focused from the start of a major change effort on addressing culture and needed changes within the organization. Organizational leaders should be cognizant of the fact that not only culture should be focused on throughout the change effort development, but that real change to an organization's culture actually occurs at the end of the change process, not at the beginning or during initial roll out of a change effort. In order to produce a successful change, both leadership and management must understand that new methods and processes will have to be closely aligned with an organization's core values or that the new methods will have to replace and ultimately become the organization's core values and part of its culture.

The constant involvement of leadership and management during the various stages of the change process will help move the process forward. However, in order to really bring about lasting change requires the new methods and approaches to be "anchored" with the organization's culture. Again, this understanding of culture and how it must also change, is crucial throughout the change effort. From the beginning, there should be an understanding of how numerous and varied systems, methodologies, values, and behaviors will have to be adjusted to ultimately change the overall culture into one that embraces all of the new methodologies and processes.

b. Stage 8 - Application

Based on the history of cultural change implications of large organizations, the culture that exists at ARDEC may very well be a difficult one to modify for the reasons identified above and throughout the paper. The Vector team must also understand that changes to any aspect of culture will only occur at this end-stage of the Vector rollout, not at the beginning. Kotter mentions that it is critical to understand the power of cultural aspects of change and that culture is really an inherent aspect associated with leadership just as structures and systems of the organization are inherent

to management. Therefore, leadership, once again will play a large role in ensuring that the new processes of Vector are not "graft[ed]…onto the old roots while killing off the inconsistent pieces," but that new processes are associated with positive gains that are visible to the people as directly related to their new, altered actions (151). It is for this reason that any cultural changes associated with Vector will be realized at the end of the transformation process when actions of the organization's members are changed and engrained. These new cultural changes would then be able to support any change in succession of organizational leaders years after the initial rollout with minimal chances of regression into the "old ways." By carefully considering all of the stages above, namely, vision, communication, and short-term wins, the activities that led to the positive actions by this point in the transformation should be quite visible to the organization, or should be understood as crucially important to the organization's leadership in all phases of the change effort.

V. CONCLUSIONS AND RECOMMENDATIONS

A. THE ISSUE AND CHALLENGES FACED BY THE VECTOR TEAM

Although the design of the Vector process requires the consideration of numerous details, one of the areas yet to be observed as being adequately planned for by the Vector team is related to the actual plans for deploying Vector to the ARDEC organization and the cultural implications surrounding Vector's rollout. Specifically, the report identified (in Chapter III) two major areas of concern that may prove to be the most challenging, based upon the authors' observations during the Vector design, their experience within the ARDEC organization, and on historical observations, specifically Kotter's common mistakes attributed to organizational change. These two areas were identified as the *Communication of Vector to ARDEC,* and *Vector Implementation Planning (Post-deployment and Enforcement).* Each of these areas was organized into a series of problem statements that encompassed the issues and challenges the Vector team will need to face within these areas. All of these problem statements are addressed here by the consideration of Kotter's common mistakes typically found in organizations seeking change and in the application of his recommended steps to follow for an organization seeking change, all of which were discussed in depth within this report. In order to stay within the scope of the report, the problem statements are addressed and concluded below in the form of guidelines.

1. Communication of Vector to ARDEC

The challenges associated with the communication of Vector to the greater ARDEC organization, to include its internal and external stakeholders such as the workforce, the customers, and industry partners, was summarized in Chapter III with the following problem statement—*How can the Vector team effectively communicate the importance of Vector to ALL of the stakeholders (internal and external)?* Additionally, taking this concern a step further, beyond the communication of Vector's importance, how can the Vector team capitalize on the strength of the organization, in other words—*How can the Vector team garner the support from the greater organization (ARDEC) and*

customers required both during design and after deployment? These two problem statements, and the entire area of concern related to Communication of Vector to ARDEC, relate specifically to Kotter's stages associated with Establishing a Sense of Urgency (Stage 1), Developing a Vision and Strategy (Stage 3), Communicating the Change Vision (Stage 4) and Generating Short-Term Wins (Stage 6).

The Vector team can effectively communicate the importance of Vector to all stakeholders by establishing a sense of urgency amongst all stakeholders. The frank and continuous presentation and discussion of crises, and the potential consequences for not following Vector, would effectively infuse the workforce with reasons to pursue Vector changes, and this allows the stakeholders to associate the change effort as a real and necessary effort with reason and purpose for its existence. By establishing a sense of urgency for change, the stakeholders would be much more receptive to the proposed end-state that would result from Vector's adoption and would establish the groundwork for communicating the reasons for pursuing Vector; this would be accomplished with a well-thought out vision for Vector. A clear and concise vision combined with a well-established sense of urgency for the change are an absolute prerequisite for ensuring effective communication to all stakeholders and would play a huge role in garnering support from the entire organization. By creating and resourcefully communicating an effective vision, the organizational members and the customers would understand the importance of Vector and clearly see the benefits associated with it. This would translate to their additional support early on by way of assuring stakeholder feedback, assistance in design, and support in the rollout of the effort—all of which results in successful adoption of this transformational effort. In order to maintain momentum after the deployment of Vector, carefully planning out short-term wins such as strategically selected pilot programs and plans for publicizing the success of those programs would help to garner the required support from ARDEC's stakeholders.

2. Vector Implementation Planning (Post-deployment and Enforcement)

The challenges associated with Vector implementation planning, specifically after Vector's deployment and Vector's enforcement, revealed a number of areas that required consideration and they were summarized in Chapter III with three problem statements:

- How can the Vector team prepare for any resistance based on culture?
- How can the Vector team ensure Vector stays its course years after deployment?
- What else should the proponents of a change effort like Vector worry about as far as Organizational Culture?

First, directly pertaining to culture, and considering the fact that Vector will require the breaking away from old ways, which is never an easy task for an organization, *how can the Vector team prepare for any resistance based on culture?* Kotter's guidance related to Empowering Broad Based Action (Stage 5) would pertain to this area of concern. Change efforts must utilize the force of the entire organization in order for change to take place successfully. Therefore, Vector must accommodate and tailor to maximize the usage of the organization's momentum for Vector adoption and continued use after deployment. Any obstacle that may stand in the way of this kind of empowerment of the organization must be removed. Kotter points out that some of the common obstacles to empowerment include structures, skills, systems, and supervisors. The Vector team must be careful in studying these areas as they exist in the current organization and designing the changes to the areas that may be required for Vector adoption. Whether these changes require the removal of infrastructure barriers and/or organizational restructuring, by focusing on these known problem areas and carefully planning for these changes, the team is better prepared to overcome resistance based on culture.

Secondly, the Vector team fully understands that the fine-tuning of a change effort such as Vector does not necessarily end when Vector is rolled-out to the organization. In fact, for complex change efforts, it would be expected that the tweaking

of these efforts would take place for a long time after the rollout, and that this may very well outlast the tenure of the founding team and designers' change efforts. This brings us to the second question related to Vector Implementation Planning—*How can the Vector team ensure that Vector maintains adherence to its vision in the years after initial deployment*? The stage pertaining to Anchoring New Approaches in the Culture (Kotter's 8th stage) would provide the most guidance for this specific problem statement. Most importantly, the Vector team should grasp that to truly anchor these change efforts within the organization is a function of the organization's culture. This area pertaining to culture is covered in the last stage for a reason, as the changes in the culture may not occur until the prior stages are addressed and successful. The new processes that Vector will introduce should be associated with positive gains that are visible to the people and directly related to their new, altered actions. All of which would be facilitated by an organization with an understanding of the urgency for change, a change effort with a vision understood by all stakeholders, an empowered organization, and the rest of the 8 stages for creating major change. After considering these key areas, these new cultural changes would be able to have a standing chance against time and the changes in succession of organizational leaders years after the initial rollout with minimal possibility of regression to the "old ways."

Finally, since organizational change is not an easy task and the consideration of the changing organization's culture makes it all the more difficult, the question that begs to be asked is—*What else should a change effort like Vector be worried about as far as Organizational Culture?* Organizational culture can be viewed as the final frontier for a change effort's team to overcome; however, the success in the adequate consideration of culture by a major change, is maximized by its early planning stage. Since Kotter's Stage 8, which is the stage related to organizational culture, is the last of the 8-stage process, and since all stages were designed to be successive, the cultural considerations and planning are built into the 8 stage process. It is obvious that every organization is different, but understanding that organizations do not respond to change as easily as an individual would respond is the first step in understanding why change efforts need to focus heavily on creating urgency for change, developing a clear and concise vision and

thoroughly communicating this vision to the organization. By studying and understanding the common mistakes that Kotter has observed in organizations attempting to achieve significant change (Chapter III), the team should be better prepared to tackle the complex issues associated with an organization's culture.

B. GUIDELINES FROM HISTORICAL ORGANIZATIONAL CHANGE EFFORTS

The ability to garner the lessons learned from previous efforts and teams is one of the most important reasons for Vector's existence and similarly, is an area that would benefit many teams pursuing an organizational change effort. Fortunately, Kotter's experiences and observations related to major change efforts are summarized in his observed common mistakes that were discussed in Chapter III. These common mistakes are directly related to his 8-stage process for creating major change which was discussed in depth and applied to ARDEC and Vector, as a case study, in Chapter IV. The application of the 8-stage process serves as a guideline to ARDEC and Vector and to any other organization and change effort with historical observations built into these.

C. CONCLUSION

The successful design and rollout of an organizational change effort is a difficult endeavor and therefore not always achieved. It was the intent of this paper to study ARDEC and Vector for the purpose of offering the Vector team (or other similar change effort teams within government agencies) guidelines for application to the Vector project (or other organizational change efforts), as needed, to ensure the adequate consideration of the cultural implications of change. The guidelines were based upon the observations of leading experts in the area of organizational change, mainly those of John P. Kotter. Through the discussion within this report, the major objective of the report was satisfied, which consisted of serving as a case study on a real organizational change effort within a government organization, offering guidelines to ensure the adequate consideration of organizational culture in major change efforts.

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